QUALITY
Access to Success

Journal of Management Systems, 6 issues per year

Publisher:
Romanian Society for Quality Assurance, Bucharest, Romania
President: **Dan Grigore Stoichițoiu**

Editorial Board:
Editor-in-Chief: **Tudor-George Mărunțelu** (Romanian Society for Quality Assurance, Bucharest, Romania)
Senior editors:
Florin Gheorghe Filip (Romanian Academy, Bucharest, Romania)
Grigore Belostecinic (Academy of Science of Moldova, Chisinau, Republic of Moldova)
Ioan C. Bacivarov („Politehnica" University, Bucharest, Romania)
Editor: **Anca Perşoiu** (Romanian Society for Quality Assurance, Bucharest, Romania)

Editorial Advisory Board:
Marin Andreica (Trade Academy Satu Mare, Romania), **Liana Anica-Popa** (Bucharest University of Economic Studies, Romania), **Gabriel Băbuț** (University of Petroşani, Romania), **Dumitru-Alexandru Bodislav** (Bucharest University of Economic Studies, Romania), **Elena Bogan** (University of Bucharest, Romania), **Stelian Brad** (Technical University of Cluj-Napoca, Romania), **Florina Bran** (Bucharest University of Economic Studies, Romania), **Giuseppe Calabro** (Universita degli Studi di Messina, Italy), **Grazia Calabro** (Universita degli Studi di Messina, Italy), **Sudip Chakraborty** (University of Calabria, Italy), **Gian Paolo Cesaretti** (Parthenope University of Naples, Italy), **Lucian-Ionel Cioca** (Lucian Blaga University of Sibiu, Romania), **Andrzej Chochól** (Cracow University of Economics, Poland), **Pietro Columba** (University of Palermo, Italy), **Sorin Cruceru** (Strayer University, Washington, D.C., N.W., USA), **Sameer Mohammed Majed Dandan** (Northern Border University, Saudi Arabia), **Vasile Deac** (Bucharest University of Economic Studies, Romania), **Cosmin Dobrin** (Bucharest University of Economic Studies, Romania), **Enrica Donia** (University of Palermo, Italy), **Nicolae Drăgulănescu** („Politehnica" University, Bucharest, Romania), **Dalina Dumitrescu** (ASEBUSS Bucharest, Romania), **Numan Muhammet Durakbasa** (Vienna University of Technology, Austria), **Carlo Giannetto** (University of Messina, Italy), **Bogdan Ionescu** (Bucharest University of Economic Studies, Romania), **Florin Ionescu** (Steinbeis University Berlin, Germany), **Maurizio Lanfranchi** (Universita Degli Studi di Messina, Italy), **Lolita Liberatore** (University "G. d'Annunzio" of Chieti-Pescara, Italy), **Bernard Morard** (University of Geneva, Switzerland), **Narcisa Roxana Mosteanu** (American University of Malta, Republic of Malta), **Nicola Mucci** (University of Florence, Italy), **Max M. North** (Coles College of Business, Kennesaw State University, USA), **Carmina S. Nunes** (ESTGA – Aveiro´s University, Portugal), **Marieta Olaru** (Bucharest University of Economic Studies, Romania), **Bogdan Onete** (Bucharest University of Economic Studies, Romania), **Rodica Pamfilie** (Bucharest University of Economic Studies, Romania), **Sabka Pashova** (University of Economics – Varna, Bulgaria), **Iuri Peri** (University of Catania, Italy), **Nenad Peric** (University Union-Nikola Tesla, Serbia), **Ion Popa** (Bucharest University of Economic Studies, Romania), **Doina I. Popescu** (Bucharest University of Economic Studies, Romania), **Sorin Popescu** (Technical University of Cluj-Napoca, Romania), **Carmen Valentina Rădulescu** (Bucharest University of Economic Studies, Romania), **Juozas Ruzevicius** (Vilnius University, Lithuania), **Irina Severin** (University Politehnica of Bucharest, Romania), **Filippo Sgroi** (University of Palermo, Italy), **Roberta Sisto** (Unversity of Foggia, Italy), **Angela Tarabella** (University of Pisa, Italy), **Mihail Aurel Țîțu** (Lucian Blaga University of Sibiu, Romania), **Ion Verboncu** (Bucharest University of Economic Studies, Romania), **Albert Weckenmann** (Friedrich-Alexander University of Erlangen-Nuremberg, Germany), **Dominik Zimon** (Rzeszow University of Technology, Poland)

Indexed in: **WEB OF SCIENCE – ESCI, SCOPUS, EBSCO, PROQUEST** and listed in **CABELL'S Whitelist**

Publisher and Journal address:
Str. Theodor Burada, No. 6, Sector 1, 010215 - Bucharest, Romania

Information:
Tel: 021.313.63.35; 0731.300.120
Fax: 021.313.23.80
E-mail: **tudor.maruntelu@srac.ro**
Website: **www.calitatea.srac.ro**

Print:
S.C. Interbrand Impex S.R.L.

The opinions presented in this publication represent only the opinions of the authors.
Any form of reproduction of any part of this journal, without the written permission of the author or publisher is forbidden.

p-ISSN 1582-2559; e-ISSN 2668-4861; ISSN-L 2668-4861

CONTENTS

Vol. 22, No. 181 - April 2021

Organization as a Function of Management and the Types of Organizational Structures that Apply in SMEs in Kosovo

Idriz KOVAÇI[1], Alberta TAHIRI[2*], Fari BUSHI[3], Mimoza ZHUBI[4]

[1]Professor Assistant, Dr., University of Applied Sciences in Ferizaj, Faculty of Tourism and Environment, Department of Tourism and Hotel Management, Kosovo; E-mail: idriz.kovaci@ushaf.net
[2]Professor Assistant, Dr., University of Applied Sciences in Ferizaj, Faculty of Tourism and Environment, Department of Tourism and Hotel Management, Kosovo; E-mail: alberta.tahiri@ushaf.net
[3]Professor Assistant, Dr., University of Applied Sciences in Ferizaj, Faculty of Tourism and Environment, Department of Tourism and Hotel Management, Kosovo; E-mail: fari.bushi@ushaf.net
[4]Professor Assistant, Dr., University of Applied Sciences in Ferizaj, Faculty of Tourism and Environment, Department of Tourism and Hotel Management, Kosovo; E-mail: mimoza.zhubi@ushaf.net
[*]Corresponding author: 35, "28 November" Street, 30000, Peja, Kosovo; E-mail: alberta.tahiri@ushaf.net

Abstract

Organizing as a managerial function is very important in the process of enterprise management, due to the fact that this function divides the tasks, responsibilities, appoints the persons who will perform the tasks and so on. For the work to be carried out effectively, each enterprise must have an organizational structure that enables the division of jobs at different managerial and operational levels. We can say that managers accomplish their mission by defining the organizational structure. Only a well-defined organizational structure is a guarantee of achieving organizational goals. In this regard, the purpose of this article is to explain the organization as a function of management and the types of organizational structures that apply in small and medium-sized enterprises in Kosovo.

Keywords: *organizing; managers; SMEs in Kosovo; organizational structure; organizational goals; flexibility; effectiveness.*

1. Introduction

The purpose of this article is to explain the organization process as one of the important managerial functions, as well as to distinguish between some types of organizational structures.

We all learn to make sense of the situations we are in. However, just like a fast-flowing river, these situations are often changing in imperceptible ways. Before too long we find that the ways we have been using to make sense leave us out of our depth! Managers find that what they took for granted no longer helps them survive as well as it did in the past. Well-established thechniques of the past, such as management by rules and instructions, by oversight and surveillance, by command and control, on the part of hierarchical managers, are changing. When everyone can be connected to anyone everywhere, when the value basis of employees is shifting radically, and when the organization laces itself over the globe and employs many of the diverse peoples that the globe has to offer, the old certainties are harder to hold. Today, more indirect tecjnoques, such as managing in and through vision, mission, culture, and values, leading to a lot less imperative instructionand command and a great deal more dialogue and discussion, are fashionable: the switch is from "hard power" in the form of imperative commands to "soft power" in the form of getting people to do what we want them to do through indirect methods, such as induction into organizational culture, training and strategy workshops, or leadership courses (Clegg, S. R., Kornberger, M. & Pitsis, T. S., 2016).

All organizations have a structure of jobs. In fact, the existence of structure distinguishes organizations. While the most visible evidence of structure is the familiar organizational chart, charts are not always necessary to describe the structure. In fact, small organizations can get along very well without them as long as everyone understands what they are to do and who they are to do it with. But jobs are not the only features of an organization. Again, from experience we know that organizations consist of departments, divisions, units, or any of a number of terms denoting groups of jobs (Gibson, J. L., et al., 2012).

Organization structure is the system of task, reporting, and authority relationships within which the work of the organization is done. Thus, structure defines the form and function of the organization's activities. Structure also defines how the parts of an organization fit together, as is evident from an organization chart. The purpose of an organization's structure is to order and coordinate the actions of employees to achieve organizational goals. The premise of organized effort is that people can accomplish more by working together than they can separately. The work must be coordinated properly, however, if the potential gains of collective effort are to be realized (Griffin, R. W. & Moorhead, G., 2014).

How activities are organized in new issue domains is a central and enduring question in organization theory. The structuring of organizational activities was a key concern of Max Weber's theory of bureaucracy and early organization theorists. Organizational structures make action reliable and non-contingent on personal and situational factors and are therefore at the core of our understanding of organizations. Consequently, structures give shape to how organizations address new issues, such as new technologies, regulatory requirements, or lines of business. Classic work in the organization design tradition suggested that an organization's formal and informal structures

can, and perhaps should, be derived rationally from the goals and strategies it pursues. The term structuration is used both to describe an ongoing process and the extent to which structures have been produced. In organization theory, organizational structures, in the form of roles, policies, and procedures, often take the place of the societal structures and institutions in Giddens' social theory. The structuration framework includes the dimension of power and allows for divergent interests and conflict (Giddens, 1984), though applications to the structuring of organizations have historically emphasized distributed sensemaking and practice coordination over processes of active advocacy and conflict (Soderstrom, S. B. & Weber, K., 2019).

The most successful organizations today are the ones capable of aligning flexible organizational solution with flexible forms of work design. Therefore, organization design does not only form, but also simultaneously limits possible choice, i.e. shapes of work design. Finally, achieving a better understanding and harmonization can result in significant development of work and organizational success. At the same time, one should have in mind that business trends, and especially tendencies of organization design at macro level define the "playing field", while each organizational unit, team and/or individual in the organization should learn how to be effective and to "play" successfully in mainly various situations (Özgur, Ö.,2016).

Organizational structure holds an important role on the performance of an organization. Therefore any one managing an organization must understand the importance of structuring an organization. There are various studies associated with effects of organizational structure and organizational performance. To start with, organization, generally is a managerial function of organizing, that involve grouping of activities, establishing authority and responsibility relationship, coordinating different functional activities in pursuit of achieving overall organizational objective and goals, and delegation of authority. Productivity is very important for an organization and that the main goal of every organization is to ensure the highest means of productivity level. Performance is one of the most essential and major issues that all organizations face and that with productivity all organization benefit of all sources and facilities to achieve more advantages (Eze, S. C., Bello, A.O. & Adekola, A. T., 2017).

2. Literature review

Management is a process of setting objectives and coordinating employees' efforts to achieve them (Tahiri, A. & Kovaçi, I., 2017). Management is a universal process of formulating and achieving goals in the organization with and through other people, utilizing the managerial functions of planning, organizing, managing and controlling, as well as efficiencyand effectively coordinating resources. Organization is the second important function of management, which comes after planning. In order to achieve the planned goals, the roles that certain members of the organization must fulfill should be divided (Zeqiri, I., 2006). The word organization comes from the Greek word "organon" which means the tool or gadget, which in this case is taken as a tool for the realization of any task. So organization is a tool, way, opportunity, action of a given task for the best possible performance (Koleci, B. & Turkeshi, N., 2008).

Organizing is the managerial function of designing and establishing relationships between activities and people in the process of securing, deploying, ranking and utilizing or exchanging organizational resources. The end result of this process is organizing (organization), realization of organizational goals, plans, budgets, policies and procedures – processes as well as the functioning of planning. Organizing means pre-operative activities because it represents the preparations for action that will follow. The function of organizing begins when the goal-setting process is completed, provides the logical flow of resource connectivity, and makes the right combination of physical and human resources (Ramosaj B., 2013). An organization is a deliberate arrangement of people to accomplish some specific purpose. All organizations have three common characteristics: distinct purpose, deliberate structure and people. Organizing is a management function that involves arranging and structuring work to accomplish the organization's goals. It's an important process, during which managers design an organization's structure. Organizational structure is the formal arrangement of jobs within an organization. This structure, which can be shown visually in an organizational chart, also serves many purposes (Robbins, S. P. & Coulter, M., 2018).The objectives of structure may be summarised as to provide for:

- The economic and efficient performance of the organisation and the level of resource utilisation;
- Monitoring the activities of the organisation;
- Accountability for areas of work undertaken by groups and individual members of the organisation;
- Co-ordination of different parts of the organisation and different areas of work;
- Flexibility in order to respond to future demands and developments, and to adapt to changing environmental influences; and
- The social satisfaction of members working in the organization.

These objectives provide the criteria for structural effectiveness. Structure, though, is not an end in itself but a means of improving organisational performance (Mullins, L. J., 2010).

The role of managers in structuring the organization should be supervised at all stages of the process. This means that a manager must have an active role in the overall process of organizational structuring. In the process of forming the organizational structure, managers must solve two problems to achieve the effectiveness and efficiency of the organizational structure. These two problems are differentiation and integration. They should be aware that special attention should be paid to: (1) Enterprises – companies are different; (2) Individual factors and parameters affect different companies in different ways; (3) Sometimes with the new organization it is desirable to achieve in the concrete enterprise a new and fulfilled quality. The following managerial activities are related to the adoption of first decisions about organization, which are divided into four groups: (1) Division of work, (2) Division of sectors, (3) Hierarchy and (4) Coordination. On the organizational structure, the manager must continually direct their activity on: identifying and evaluating the organizational structure of the company, thinking about the use of analytical tools, identifying employees who will be actively involved in the organizational structure issue, identifying external entities that will be actively involved in organizational structure issues. Lastly, every manager should know how a company should function at different stages of development. Thus, knowing the basic characteristics of the development stages of the company, the manager will do the following: define the organizational structure, management conception, setting goals and innovative processes, discover the possible causes for creating crisis situations, facing them and learning them, will in time influence them in order to function actively (Postolov, K. & Drakulevski, L., 2010).

In analyzing the internal environment, recognition the structure of the organization is very important. The structure of the organization is often defined by the terms of communication, authority, and mutual relationships within the organization. It is about coordinating the roles and relationships of employees within the firm. Recognition of the structure is important for the formulation of the corporate mission. If the structure is in line with the proposed changes to the strategy, it is about power, and on the other hand it is about a firm weakness. Organizational structure should be seen in three dimensions: concentration, specialization, and flexibility (Kume, V., 2007).

There are different types of organizational structures within enterprises, and based on the functioning of small and medium-sized enterprises in Kosovo we will focus on some of them, namely the pyramid (hierarchical), functional, divisional, project and matrix structure.

When the organizations grows bigger, a hierarchical system will develop. The hierarchy may serve many different purposes in the organization, but often, importance is atached to authority and the right to make certain types of decisions. Earlier, when analyzing hierarchies, inpiration was derived from military systems, hence the concepts of line and staff, which appear in many organizational analyses. Line is referred to as a chain of command in military terminology (Lægaard, J. & Bindslev, M., 2006).

Functional organizational structure is characterized by the specialization of the roles of employees in the enterprise. It divides the entire task of the enterprise into several groups according to the principle of subordinate goals. The typical functional organizational structure of an enterprise is when it divides the entire task of the enterprise into four (functional) groups: manufacturing, marketing, financial and personnel. Functional organizational structure mainly characterizes production enterprises (Ramosaj B., 2013).

The divisional organizational structure is characteristic of enterprises having diversified activities that relate to many market segments and more destination centers. Such organizational structure is found in multinational or interregional companies offering more product or service items (Ramosaj B., 2013). When a divisional structure overlays its functional groups, an organization can coordinate its activities more effectively. Organizations can choose from three kinds of divisional structure: product, market, and geographic structures. Each is suited to a particular kind of coordination problem facing an organization (George, J. M. & Jones, G. R., 2012).

A project organization is a structure that facilitates the coordination and implementation of project activities. Its main reason is to create an environment that fosters interactions among the team members with a minimum amount of disruptions, overlaps and conflict. One of the important decisions of project management is the form of organizational structure that will be used for the project (PM4DEV, 2016).

The matrix principle or matrix organization may be referred to as a theoritical model which can be realized in different ways (Lægaard, J. & Bindslev, M., 2006).The matrix organizational structure is the result of coordination of decision-making in complex enterprises, in which development research work is the main activity. These include: scientific institutions, research institutions, cosmic institutions, the aviation industry and some military industry activities (Ramosaj B., 2013).

3. Methodology

The methodology of this article is based on the theoretical study of organization as a managerial function and the organizational structure of enterprises, as well as on the empirical study of the types of organizational structures applied by SMEs in Kosovo. Data sources consist of books, journals, the Internet, all related to management literature. Whereas, primary data were obtained mainly through direct survey of owners and managers of 50 different SMEs in Kosovo. Meeting with enterprises leaders enabled us to make a clear approach on how the internal organizing function of these enterprises works and what differentiated organizational structure apply different SMEs in Kosovo.Thus, the sample of the research consists of 50 enterprises, of which 7 are manufacturing enterprises, 16 service enterprises and 27 commercial enterprises.

4. Results

The notion of forming, creating and designing the organizational structure is used as a synonym and indicates the process of building the organizational structure. Business owners looking to create a useful organizational structure recognize that this process represents a complex process. For this reason, it is important that owners or managers strive hard for the chosen structure to be an entrepreneurial activity. An effective organizational structure allows enterprises in general to benefit from their competitive advantages and create new advantages. A well-established structure gives members a means to maintain order and resolve disputes. The structure links the members of the enterprise together. After processing and analyzing the data collected from the questionnaire, the results obtained have accomplished the objective of this article.

The following is a summary of the types of organizational structures applied by small and medium-sized enterprises in Kosovo.

Structure	Frequency	Percent	Valid Percent	Cumulative Percent
Pyramid	22	44%	44%	44%
Functional	23	46%	46%	90%
Divisional	2	4%	4%	94%
Project	2	4%	4%	98%
Matrix	1	2%	2%	100%
Total	**50**	**100%**	**100%**	

Table 1. Organizational structure of SMEs in Kosovo

Compiled by the author on the basis of the results obtained from the questionnaire

For SMEs in Kosovo, the survey sample showed that 44% of enterprises apply the pyramid structure, 46% functional structure, 4% divisional structure, 4% project structure and 2% matrix structure.

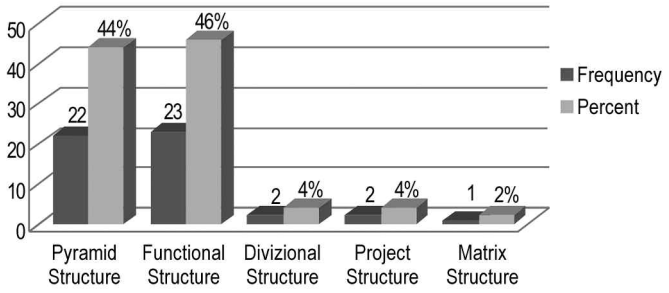


Figure 1. Organizational structure of SMEs in Kosovo

Compiled by the author on the basis of the results obtained from the questionnaire

In the organizing process of enterprises in Kosovo, the leadership role of these enterprises has proved to be very important. Based on this, we can say that enterprise leaders / managers are the ones who name the processes that are carried out in the enterprise, i.e. they make clear what duties and responsibilities have everyone in the workplace.

Over the past three years the leaders of these enterprises have been asked where the biggest changes have occurred, and the results have been such that there have been changes in the number of employees, in the enterprise culture and in the organizational structure. Based on the purpose of this article that was mainly to talk about organizational structures, we expanded on this section by giving clearer results. In this way, in those enterprises that had changed organizational structure, we received further clarification on what changes were most relevant. The changes that have taken place in the organizational structure of SMEs in Kosovo over the last three years are:

- The change of the structure to suit the taste, fashion and trend of the time;
- The biggest changes lately have occurred in job positions;
- Organizational structure and strategic planning have changed;
- Changes in technology advances where some of the services in the technology field have been converted that have impacted the structure;
- The increase of the number of departments and jobs;

- ❑ Adding business units to new locations;
- ❑ Adding management;
- ❑ Adaptation of structures to European markets;
- ❑ Change of responsibilities and changes in positions on the Board of Directors;
- ❑ Removal of older workers abroad while younger workers are hired.

It is worth noting that the organizational structures of the respective enterprises are quite flexible, which means that the management of these enterprises is almost always ready to cope with the innovations of today's market which is highly competitive. Also, the effectiveness of the applied organizational structures is high.

5. Conclusions

In all surveyed enterprises the management applies a separate organizational structure, which distinguishes the enterprises from each other. In this way, there we present the conclusions for each type of organizational structure that is applied and the reasons for their suitability with the way these enterprises are lead.

Thus, the pyramid organizational structure:

- ❑ It is appropriate because the authority lies at the top management level and the distribution of tasks is at the highest level;
- ❑ Adapted to the activities that enterprise performs as well as to the work dynamics;
- ❑ It shows adaptability because decisions are made based on the competencies of managers in the hierarchy;
- ❑ There is a categorization of managers that enables the division of authority and responsibilities;
- ❑ With the application of this structure, there is no shortage of managerial and market success;
- ❑ The tasks decomposition is made according to hierarchical levels;
- ❑ This type of organizational structure has resulted in high performance in the enterprise and has led employees to show high performance in various activities.

The functional organizational structure:

- ❑ Enterprises with this structure have been in the market for a long time;
- ❑ As a typical structure that companies use in their early stages, coordination and control remain with top management;
- ❑ It is convenient considering that it operates in different locations where everyone has their own market and autonomy;
- ❑ Has brought high results for the enterprise;
- ❑ It enables high collaboration between departments and they support each other in problem solving.

The divisional organizational structure:

- ❑ It is suitable because it enables penetration in the markets of different countries;
- ❑ For the companies that have applied it has worked well and has consistently been successful.

The project organizational structure:

- ❑ It offers high adaptability because there is collaboration between the managers of each unit on projects related to the company activity;
- ❑ For different firms it is also worth collaborating with SBUs that have them outside of Kosovo.

And the matrix organizational structure:

- ❑ It offers adaptability because it requires constant collaboration between company stakeholders.

References

[1] Clegg, S. R., Kornberger, M. & Pitsis, T. S. (2016). *Managing and Organizations, An Introduction to Theory and Practice*, SAGE, London.
[2] Gibson, J. L., et al. (2012). *Organizations: Behavior, Structure, Processes*, Fourteenth Edition, McGraw-Hill, New York.
[3] Griffin, R. W. & Moorhead, G. (2014). *Organizational Behavior: Managing People and Organizations*, Eleventh Edition, South-Western Cengage-Learning, USA.
[4] Soderstrom,S. B. & Weber, K. (2019). Organizational Structure from Interaction: Evidence from Corporate Sustainability Efforts, *Administrative Science Quarterly*, SAGE Journals, Vol. 65, Issue 1, 226-271.
[5] Özgur, Ö. (2016). Modern Structural Organization Theory: From Mechanistic vs. Organic Systems of Burns & Stalker to Technology of Burton &Obel, *Global Journal of Human Resource Management*, European Centre for Research Training and Development UK, Vol. 4, No. 2, 30-46.
[6] Eze, S. C., Bello, A.O. & Adekola, A. T. (2017). The Effects of Organizational Structure on the Performance of Organizations, *European Journal of Business and Innovation Research*, European Centre for Research Training and Development UK, Vol. 5, No. 6, 46-62.
[7] Tahiri, A. & Kovaçi, I. (2017). *Management in Tourism, Theoretical Managerial Approach*, Research Center, Peja.
[8] Zeqiri, I. (2006). *Management, Concepts, Practices, Skill Development*, South East European University in Tetovo, TringaDesing, Tetovo.
[9] Koleci, B. & Turkeshi, N. (2008). *Management, Fundamentals of Management*, FON University, Furkan ISM, Skopje.
[10] Ramosaj B. (2013). *Management, Fundamentals of Management*, University of Prishtina, Prishtina.
[11] Robbins, S. P. & Coulter, M. (2018). *Management*, Fourteenth Edition, Pearson, New York.
[12] Mullins, L. J. (2010). *Management & Organisational Behaviour*, Ninth Edition, Pearson Education Limited, England.
[13] Postolov, K. & Drakulevski, L. (2010). *Organizing*, Ministry of Education and Science of the Republic of Macedonia, Skopje.
[14] Lægaard, J. & Bindslev, M. (2006). *Organizational Theory*, Ventus Publishing ApS.
[15] George, J. M. & Jones, G. R. (2012). *Understanding and Managing Organizational Behavior*, Sixth Edition, Pearson, USA.
[16] Kume, V. (2007). *Strategic Management*, Publishing House “Pegi” &The Author, Tirana.
[17] Project Management Organizational Structures (2016). *A methodology to manage development projects for international humanitarian assistance and relief organizations*, PM4DEV. (https://www.pm4dev.com/resources/free-e-books/3-the-project-management-organizational-structures/file.html)

Developing a Safety Performance Model through Mediation of Safety Behavior

Aan KHUROSANI[1], Jasanta PERANGINANGIN[2*]

[1]Universitas Sultan Ageng Tirtayasa, Indonesia
[2]Sekolah Tinggi Pariwisata Sahid Surakarta, Indonesia
[*]Corresponding author; E-mail: jasanta_pa@gmail.com

Abstract

Safety performance is a priority issue in every business because it is about the soul of other individuals. This research is aimed to develop a safety performance model through mediation of safety behavior. This model becomes very important because it can be used operationally in business environment. Method of research is quantitative using Structural Equation Model (SEM) supported by a software called SPSS AMOS. Sampling method is purposive sampling. Several findings are obtained from this research. Safety culture has significant effect on safety performance. Management commitment has significant effect on both safety performance and safety behavior. Moreover, safety behavior has significant effect on safety performance. One hypothesis is rejected, which precisely is the significant effect of safety culture on safety performance. Theoretical contribution given by this research is shown through the use of Planned Behavior Theory to elaborate the content of research. Practically, the results of this research are expected to be useful in business practice, especially related with managerial activity for employee safety. In social perspective, this research implicates to the reduction of work accident rate.

Keywords: *safety performance; safety behavior; safety culture; management commitment.*

1. Introduction

Work accident rate in Indonesia has been increasing. Most work accidents involve employees with productive age. This phenomenon forces the company where these employees work to suffer the lost. In macro perspective, it may increase government burden to pay the insurance. Data from the last three years show that work accident rate is indeed increasing, and number of the victims, either dead or defected, is very high (Statistics, 2019). At long term, high work accident rate can intrude business competition (Porter, 1990, Peranginangin, 2015). Therefore, the review on safety behavior and safety performance becomes very important to do.

Smith and Wadsworth (2009) said that work accident can occur due to some reasons such as poor hazard management, hazardous substances, work at height, moval repetition, using dangerous machine, work stress, voice pollution, and using manual equipment. This previous research concluded that work safety can be achieved through behavioral engineering, organizational commitment, and safety culture, which all of them are oriented toward sustainability (Neal and Griffin, 2002, Setiyaningrum and Peranginangin, 2018).

This research believes that safety performance is affected by subjective norms, intention toward behavior, and perceived behavioral control. That is why this research refers to Planned Behavior Theory proposed by Ajzen (1991). Planned Behavior Theory also explained about norms built by individuals in organization and the growth of these norms during the life of organization (Shin et al., 2018). Safety performance greatly relies on behavioral construction and management commitment in building safety behavior in work environment.

Research is designed to be divided into five sections. First section comprises the introduction of the anchor theory and the importance of this research. Second section discusses relevant previous researches and also research model development. Third section explains about research methodology. Fourth section is provided for the results of research and the discussion of them. Final section is for conclusion, research contribution, and agenda for the next research.

2. Literature Review

2.1. Safety Performance

Review on safety performance is a very fundamental activity because it touches with workforce safety. Safety performance is the ability to improve work health and work safety of the self, coworker, environment and community (Hofmann et al., 1995). Safety performance is indicated by health and safety of the workers (Griffin, 2000). Work health is about keeping the workers in health during at work and preventing them from suffering work stress. Work safety is materialized by prohibiting workers from consuming alcohol and smoking cigarette during at work, and ensuring that they stay away from possible work accident, either minor or major incidents.

The management of safety performance has strong impact on long term viability of company operational, especially on human resource in the company (Burke et al., 2002). Safety performance is an interdisciplinary issue, and therefore, its management is like an orchestra of various elements. Good management over these elements would help creating harmony across departments in organization (Cooper, 2015, Mukhsin and Peranginangin, 2021).

Mearns et al. (2003) discovered that company can increase

safety performance by assigning individuals at managerial level to become caretaker of worker safety. Usually, this caretaker will integrate workers to the goals of organization by expecting that they improve their performance and help organization to perform well (Burke and Signal, 2010, Setiawan et al., 2019). Safety performance is really helpful to reduce work accident rate and work-related incidents, such as poisoning, ills, and injuries during at work or after work.

2.2. Safety Behavior

An old proverb said that practice makes perfect. Safety behavior is a competence-based behavior that needs a lot of practices. Safety behavior is a positive behavior that must be maintained to produce work safety (Vinodkumar and Bhasi, 2010). Shamsudin et al. (2015) explained that one example of safety behavior is to report every event that potentially harms work safety.

Safety behavior dimension is divided into two, namely structural safety behavior and personal safety behavior (Hsiang, 2011). More extensively, safety behavior dimension has many forms, such as workers' self-sufficiency in solving their problem, implementing standard operating procedure (SOP) in solving the problem, identifying problem and error and then reporting it to top management, and actively giving positive suggestion for performance improvement (Aryee and Hsiung, 2016). So far, it can be said that safety behavior has very strong effect on improvement of safety performance.

2.3. Safety Culture

Safety culture was firstly introduced by International Atomic Energy Agency (IAEA) in thirty years ago. Safety culture is containing values, attitudes, perceptions, behaviors, styles and skills in managing work health and work safety (Smith and Wadsworth, 2009, Nevi and Peranginangin, 2019). Safety culture is understood through norms and policies regarding work safety, shared values, and beliefs, behaviors, and attitudes over work health and work safety.

Safety culture has significant effect on safety performance and implicates to strong participation in enforcing workers safety (Shamsudin et al., 2015). Safety culture is created by the drive toward safety behavior, the supervision over organizational leadership, and the competence on safety (Boniface, 2016, Peranginangin and Kusumawardhani, 2018).

Froko et al. (2015) found that safety culture has significant effect on safety performance. One indicator with the most dominant effect is the compliance with safety standard initiated by company. Other study showed that safety culture significantly impacts both safety behavior and safety performance (Hsiang, 2011). Based on the explanations given above, the following hypotheses are made as follows:

H1: High safety culture is associated with high safety performance.

H2: High safety culture is associated with high safety behavior.

2.4. Management Commitment

Management commitment is a main key to create safety behavior and improve safety performance (Mearns and Reader, 2008). Management commitment must take concrete actions to produce competitiveness. Other research said that management commitment has significant effect on the improvement of safety behavior and safety performance in the company (Aryee and Hsiung, 2016).

Management commitment is created by leaders in the company. Management commitment can be measured from how good the leadership in the company is and how close the leader is with the followers (Inness et al., 2010). Management commitment involves several activities such as increasing risk awareness, building positive behavior regarding work safety, communicating company values concerning safety, and conducting effective monitoring (Beus et al., 2010).

A research by Hadikusumo et al. (2017) found that high management commitment is associated with high safety behavior and high safety performance. Similarly, Ashour et al. (2018) showed that management commitment has significant effect on safety performance. Pursuant to all explanations given in this section, other hypotheses are proposed as follows:

H3: High management commitment is associated with high safety behavior.

H4: High management commitment is associated with high safety performance.

H5: High safety behavior is associated with high safety performance.

Referring to the results of previous researches and the hypotheses that have been developed, then research model is created as depicted in the following.

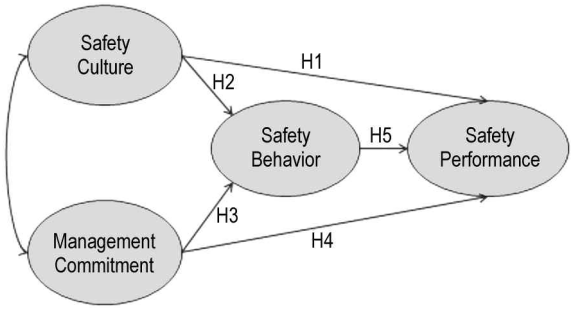


Figure 1. Proposed Model
Source: Developed for this research (2020)

3. Research Method

3.1. Research Object and Analytic Unit

The object of research is textile industry of Indonesia, while the analytic unit of this research is the employees who work at certain department in this industry and their work has high risk. This research uses purposive sampling as sampling technique. It is done by distributing structured questionnaire containing closed and open questions. Closed questions use a scale of 1 to 10, where Score 1 is for Very Disagree and Score 10 is for Very Agree (Zikmund et al., 2012). Besides closed questions, respondents are also given open questions that obligate respondents to give answer in elaboration, especially to elaborate things that cannot be revealed by closed questions (Sekaran and Bougie, 2016).

3.2. Analysis Technique and Model Testing

Research type is quantitative research. Analysis technique of this research is Structural Equation Model (SEM) supported by supported by a software called SPSS AMOS (Arbuckle, 2014). Analysis technique involves construct validity and construct reliability. One construct is considered valid if it has standardized loading of ≥ 0.70 with Average Variance Extracted (AVE) value of ≥ 0.50. Construct reliability is perceived as good if it has value of ≥ 0.70 (Tabachnick and Fidell, 2013).

Research model has been tested. The testing process is conducted by measuring goodness of fit of the model, and the measurement results are then compared with goodness of fit indices. There are criteria for these indices, such as small Chi-square, probability level of ≥ 0.05, Goodness of Fit Index (GFI) that goes near 0.90, Adjusted Goodness of Fit Index (AGFI) that approaches to 0.90, Comparative Fit Index (CFI) that comes near 0.90, Tucker Lewis Index (TLI) that approximates to 0.90, Root Mean Square Error of Approximation (RMSEA) that stands between 0.05 and 0.08, and CMINDF at below 2 (Hair et al., 2014, Fornell and Larcker, 1981).

4. Results

There are two hundreds and fifty (250) questionnaires given to respondents. Of these questionnaires, one hundred and ninety seven (197) respondent data are obtained and then processed. Based on these numbers, response rate is 79%. Related to gender, male respondent is 74% of total or 146 persons, while female respondent is 36% or 51 persons. Concerning with marital status, the married respondent is 65% or 128 persons, while single respondent is 35% or 71 persons. Most respondents are graduated from high school, and it is indicated by 87% of total or 171 persons, while the remaining is holding academic title, which is represented by 13% of total or 28 persons.

4.1. Validity and Reliability Testing

Structural Equation Model (SEM) says that indicator is considered good if it has factor loading rate of ≥ 0.70. Factor loading rate of most indicators has fulfilled this condition. Construct validity is measured using convergent validity and this measurement involves the calculation of Average Variance Extracted. Construct reliability is measured by squaring standardized loading rate of each indicator of the variable.

No.	Variable/Indicators	Std. Loading (Lamda Value)	Convergent Validity (AVE) ≥0.50	Construct Reliability ≥0.70
1	Safety Culture		0.535	0.821
	SC1	0.710		
	SC2	0.755		
	SC4	0.718		
	SC5	0.741		
2	Management Commitment		0.557	0.790
	MC8	0.700		
	MC9	0.757		
	MC10	0.779		
3	Safety Behavior		0.555	0.873
	SB11	0.694		
	SB12	0.776		
	SB13	0.763		
	SB14	0.799		
	SB15	0.770		
4	Safety Performance		0.624	0.887
	SP16	0.720		
	SP17	0.793		
	SP18	0.851		
	SP19	0.813		
	SP20	0.727		

Table 1. Convergent Validity and Construct Reliability
Source: Result of data processing (2020)

As shown in Table 1 above, the convergent validity value of safety culture is 0.535, while convergent validity values for management commitment, safety behavior and safety performance, chronologically, are 0.557, 0.555, and 0.624. All convergent validity values of all variables exist at ≥ 0.50, which signifies that all constructs have good validity. Moreover, the reliability value of safety culture is 0.821, whereas reliability values of management commitment, safety behavior and safety performance, in chronological order, are 0.790, 0.873, and 0.887. All construct reliability values are at above 0.70, which based on this, it can be said that all constructs are reliable, or that every indicator of the variable is indeed explaining the existence of variable.

4.2. Goodness of Fit Indices

Goodness of fit indices are used to measure the degree of conformity of research model. Those indices allow researcher to ensure that theoretically and based on data, the sample obtained from the field has fulfilled the criteria of cut off value in Structural Equation Model (SEM). Data of goodness of fit indices have been processed, and the result is presented in the following:

No.	Goodness of Fit Indices	Result	Goodness of Fit
1	Chi-square	239.498	Fit Marginal
2	Prob	.0001	Fit
3	GFI	0.887	Fit Marginal
4	AGFI	0.851	Fit Marginal
5	CFI	0.939	Fit
6	TLI	0.928	Fit
7	RMSEA	0.071	Fit
8	CMINDF	2.065	Fit Marginal

Table 2. Result of Goodness of Fit Test
Source: Result of data processing (2020)

Based on what Table 2 has shown, it seems that chi-square, GFI, AGFI, and CMINDF have degrees of conformity that almost go near fit. Other indices, such as probability, CFI, TLI, and RMSEA, have good degree of conformity. In regard of this statement, it can be said that research model has fulfilled the requirement of degree of conformity in SEM AMOS.

4.3. Hypothesis Testing

After testing construct validity, construct reliability and goodness of fit based on the requirements, next step is testing the full model hypotheses. This research conducts hypothesis test using SPSS AMOS and the outline is shown in the following:

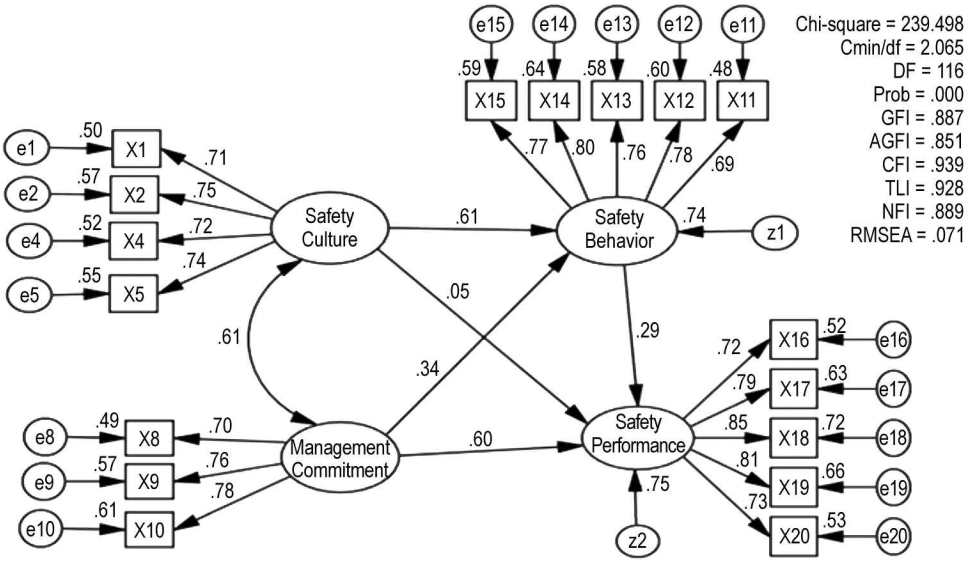


Figure 2. Structured Equation Model of Full Model Hypotheses
Source: Result of data processing (2020)

Full model testing has been executed. The result shows that the correlation across exogenous variables, which is between safety culture and management commitment, has a value of 0.61, which indicates that there is no correlation across exogenous variables. Moreover, regression weights processing in SEM has been applied on research hypotheses. Result of data processing with regression weights is shown in the following table.

No.	Hypothesis	Estimate	S.E	C.R	P	Result
1	Safety Culture → Safety Performance	.053	.125	0.428	.669	Rejected
2	Safety Culture → Safety Behavior	.606	.089	6.825	***	Accepted
3	Management Commitment → Safety Behavior	.302	.070	4.331	***	Accepted
4	Management Commitment → Safety Performance	.572	.069	5.954	***	Accepted
5	Safety Behavior → Safety Performance	.319	.147	2.168	.030	Accepted

Table 3. Regression Weights in Structural Equation Model
Source: Result of data processing (2020)

Referring to what is displayed in Table 3, it is shown that all hypotheses, except Hypothesis One, are accepted. Hypothesis One, which states that high safety culture is associated with high safety performance, is rejected. Hypothesis Two, which says that high safety culture is associated with high safety behavior, is accepted and in very significant category. Hypothesis Three stating that high management commitment is associated with high safety behavior is also accepted and in very significant category. Hypothesis Four saying that high management commitment is associated with high safety performance is accepted with very significant category. Hypothesis Five, which is that high safety behavior is associated with high safety performance, is very significantly accepted.

5. Conclusion, Suggestion, and Agenda for Future Research

Results of research have proved that safety behavior plays important role in improving safety performance. Safety behavior is a bridge to improve safety performance. Safety behavior is developed from the strong thrust power of safety culture and management commitment. Therefore, it can be said that the development of safety behavior to improve safety performance should be done together with the development of safety culture and management commitment.

Moreover, results of research have given theoretical contribution to the development of Planned Behavior Theory. This research also contributes to the development of management science, especially the management of company operational. Practically, this research provides a reference to develop operational management to improve safety performance of the company. Socially, this research has great contribution to the community, and if the results are used properly, it will impact on the reduction of work accident rate.

This research has two limits. One limit is that of five hypotheses examined, only one hypothesis is rejected, which is Hypothesis One stating that high safety culture is associated with high safety performance. Further verification is needed to generalize this concept. Other limit is that only three antecedent variables of safety performance are observed, and it seems that other variables can still be put under investigation. The involvement of other variable would make the next research about safety performance become more deterministic and holistic.

References

[1] Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.

[2] Arbuckle, J. L. (2014). *IBM SPSS Amos 23 User's Guide*, United State od America, Amos Development Corporation.

[3] Aryee, S. & Hsiung, H.-H. (2016). Regulatory Focus and Safety Outcomes: An Examination of The Mediating Influence of Safety Behavior. *Safety Science*, Vol. 86, pp. 27-35.

[4] Ashour, A. M., Hassan, Z. & Alekam, J. M. E. (2018). A Conceptual Framework for Upgrading Safety Performance by Influence Safety Training, Management Commitment to Safety and Work Environment: Jordanian Hospitals. *International Journal of Business and Social Research*, Vol. 8, pp. 25-35.

[5] Beus, J. M., Bergman, M. E. & Payne, S. C. (2010). The Influence of Organizational Tenure on Safety Climate Strength: A First Look. *Accident Analysis and Prevention*, Vol. 42, pp. 1431-1437.

[6] Boniface, O. (2016). A Safety Culture Development Model for the SMEs in the Building and Construction Industry. *Journal of Emerging Trends in Economics and Management Sciences*, Vol. 7, pp. 106-115.

[7] Burke, M. J., Sarpy, S. A., Tesluk, P. E. & Crowe, K. S. (2002). General Safety Performance: A Test of A Grounded Theoretical Model. *Personnel Psychology*, Vol. 55, pp. 429-457.

[8] Burke, M. J. & Signal, S. M. (2010). Workplace Safety: A Multilevel Interdisciplinary Perspective. *Research in Personnel and Human Resources Management*, Vol. 29, pp. 1-47.

[9] Cooper, D. (2015). Effective safety leadership: Understanding types & styles that improve safety performance. *Professional Safety*, 60(2), 49-53.

[10] Fornell, C. & Larcker, D. F. (1981). Evaluating Structural Equation Modell With Unobservable Variables and Measurement Error. *Jounal of Marketing Research*, Vol. 18(1), 39-50.

[11] Froko, I. U.-F., Maxwell, A. & Kingsley, N. (2015). The Impact of Safety Climate on Safety Performance in a Gold Mining Company in Ghana. *International Journal of Management Excellence*, Vol. 5, No. 1, pp. 556-566.

[12] Griffin, N. A. (2000). Perceptions of Safety at Work A Framework For Linking Safety Climate to Safety Performance. *Journal of Occupational Health Psychology*, Vol. 5, pp. 347-358.

[13] Hadikusumo, B. H. W., Jitwasinkul, B. & Memon, A. Q. (2017). Role of Organizational Factors Affecting Worker safety Behavior: A Bayesian Belief Network Approach. *Elsevier Procedia Engineering*, Vol. 171, pp. 131-139.

[14] Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2014). *Multivariate Data Analysis*, United State of America, Pearson Education Limited.

[15] Hofmann, D., Jacobs, R. & Landy, R. (1995). High Reliability Process Industries: Individual, Micro, and Macro Organizational Influences on Safety Performance. *Journal of Safety Research*, Vol. 26, pp. 131-149.

[16] Hsiang, C. Y. (2011). Safety Culture, Safety Behavior and Safety Performance in Railway Companies. *9th World Congress on Railway Research*, Vol. 9, pp 1-21.

[17] Inness, M., Turner, N., Barling, J. & Stride, C. B. (2010). Transformational Leadership and Employee Safety Performance: A Within-Person, Between-Jobs Design. *Journal of Occupational Health Psychology*, Vol. 15, No. 3, pp. 279-290.

[18] Mearns, K., Whitaker, S. M. & Flin, R. (2003). Safety Climate, Safety Management Practice and Safety Performance in Offshore Environments. *Safety Science*, Vol. 41, pp. 641-680.

[19] Mearns, K. J. & Reader, T. (2008). Organizational Support and Safety Outcomes: An un-Investigated Relationship? *Safety Science*, Vol. 46, pp. 388-397.

[20] Mukhsin, M. & Peranginangin, J. (2021). Improving Operational Performance through Supply Chain Collaboration. *Quality-Acces to Succes*, Vol. 22, No. 180, pp. 86-90.

[21] Neal, A. & Griffin, M. A. (2002). Safety Climate and Safety Behaviour. *Australian Journal of Management*, Vol. 27, pp. 67-75.

[22] Nevi, R. & Peranginangin, J. (2019). Effect of Religiosity, Job Stress, And Job Attitude on Performance. *Jurnal Organisasi dan Manajemen*, Vol. 15, pp. 82-97.
[23] Peranginangin, J. (2015). A Conceptual Mapping Resource Advantage Theory, Competitive Advantage Theory, and Transient Competitive Advantage. *Expert Journal of Business and Management*, Vol. 3, Issue 2, pp. 140-149.
[24] Peranginangin, J. & Kusumawardhani, A. (2018). Islamic Relationship Value, Adaptive Selling, and Relationship Quality Effect to Salesforce Performance. *Journal of Business and Retail Management Research*, Vol. 12, pp. 37-42.
[25] Porter, M. E. (1990). The Competitive Advantage of Nations. *Harvard Business Review*, March-April, pp. 74-91.
[26] Sekaran, U. & Bougie, R. (2016). *Research Methods for Business: A Skill-Building Approach*. Seventh Edition ed. United Kingdom: John Wiley & Sons Ltd.
[27] Setiawan, A. I., Rahardian, R., Novela, I., Utami, D. E. & Peranginangin, J. (2019). Internalizing the Harmonized Quality Supervision to Synchronize Technological and Market Insight in Indonesia's Printing Industry. *International Journal of Business*, Vol. 24, 1-43.
[28] Setiyaningrum, W. & Peranginangin, J. (2018). Convergent Strategy towards Competitive and Sustainability Competitive Advantages in Online Media Competition. *International Journal of Civil Engineering and Technology*, Vol., pp. 499-507.
[29] Shamsudin, F. M., Subramaniam, C., Al-Shuaibi, A. S. & Backhirov, A. (2015). Safety Behavior at Work: The Role of Safety Climate and Fear of Negative Evaluation. *British Academy of Management*, pp. 1-8.
[30] Shin, Y. H., Im, J., Jung, S. E. & Severt, K. (2018). The Theory of Planned Behavior and the Norm Activation Model Approach to Consumer Behavior Regarding Organic Menus. *International Journal of Hospitality Management*, 69, 21-29.
[31] Smith, A. P. & Wadsworth, E. J. K. (2009). *Safety Culture, Advice and Performance*. United Kingdom: Cardiff University.
[32] Statistics (2019). *Statistics Indonesia.* Indonesia: Badan Pusat Statistik (Indonesia Central Bureau of Statistics).
[33] Tabachnick, B. G. & Fidell, L. S. (2013). *Using Multivariate Statistics*, United State of America, Pearson Education.
[34] Vinodkumar, M. & Bhasi, M. (2010). Safety Management Practices and Safety Behaviour: Assessing the Mediating Role of Safety Knowledge and Motivation. *Accident Analysis and Prevention*, Vol. 42, No. 6, pp. 2082-2093.
[35] Zikmund, W. G., Babin, B. J., Carr, J. C. & Griffin, M. (2012). *Business Research Methode*, United State of America, Cengage Learning.

Investigating the Maturity Level of Computer-Based Accounting Systems in Small and Medium-Sized Enterprises: Empirical Evidence in Indonesia

M. Noor ARDIANSAH [1*], Indah ANISYKURLILLAH [2], Udin UDIN [3*]

[1]Semarang State Polytechnic, Semarang, Indonesia
[2]Semarang State University, Semarang, Indonesia
[3]Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia
[*]Corresponding authors; E-mail: mnardiansah@polines.ac.id; udin_labuan@yahoo.com

Abstract

This study aims to provide empirical evidence of the maturity level of computer-based accounting systems adopted by small and medium enterprises (SMEs) in Semarang – Indonesia. This study is motivated by the limited research on antecedents' adoption of computer-based accounting systems in SMEs. A survey of 120 SMEs in the city of Semarang through the questionnaires is conducted. Data further is analyzed using the correlation test. The results show the maturity level of the SMEs accounting system at the third level (defined) have been determined, but are not yet optimal. Key maturity activities are significantly related to planning and organization, business process management, risk management, and problem management, as well as system standardization and measurement. The results of this study contribute to the government to create a strategy to strengthen adoption by strengthening the SMEs system maturity.

Keywords: *maturity level of the system; small and medium enterprise; computer-based accounting system.*

1. Introduction

In recent years, the development of information technology (IT) has significantly changed the business (Elliott, 1992) and makes it gains a competitive advantage (Porter & Millar, 1985). Therefore, various business entities have used IT as a resource to increase productivity, product quality, and service satisfaction and create confidence for consumers as well as making relevant decisions (Matrane, Talea, & Okar, 2015). IT has influenced no exception in the form and substance of business, but also the recording techniques in accounting (Ardiansah, 2011). The accounting system is needed to capture not only financial but also non-financial data to support more relevant financial information (Brecht & Martin, 1996). The accounting system must be able to produce reliable, accurate, and timely information that is relevant to making a decision (Ismail, Abdullah, & Tayib, 2003).

Small and medium enterprise (SME) has adopted a computer-based accounting system (CBAS) model because it is considered important and determines the survival and success of the business (Louadi, 2009). SME also needs to increase the competitiveness of prices and product quality to compete with large companies (Ardiansah, 2011). Furthermore, SME has experienced a high failure rate (Ballantine, Levy, & Powell, 1998), because of their inability to influence market prices by changing output levels (Storey & Cressy, 1996). SME has a small market share, relying heavily on a small number of customers (Storey & Cressy, 1996). Thus, to be able to compete successfully, SME should have an information system that will make it possible to prepare reports more timely and informed about business decisions (Ismail et al., 2003).

The urgency and existence of SME in the developing country have received great attention in the number of literature. SME plays an important role because of its significant contributions to fulfilling employment and income distribution in many countries (Ardiansah, 2011; Seyal, Rahim, & Rahman, 2000). Moreover, the important contribution of SME in the Indonesian economy as a developing country, it was clear, among others that the number of 52.4 million business units absorbed 67% of the workforce with a contribution to gross domestic product (GDP) of 63.5% and a contribution to total exports of 18.4% (Badan Pusat Statistik, 2017).

A number of studies have been conducted to identify factors that influence the level of IT use among SMEs (e.g., DeLone, 1981; Raymond, 1985; Montazemi, 1988; Davis, 1989; Lees, 1987; DeLone & McLean, 2004; Kartiwi, Hussin, Suhaimi, Mohamed Jalaldeen, & Amin, 2018). Some of these identified factors have an influence on the IT maturity adoption among SMEs, for example, organizational characteristics such as size and business age, managerial characteristics, employee IT knowledge, consultant support, government support, information intensity, and external pressure. This makes the IT maturity model factor in SME interesting for further.

Most of the studies on IT implementation in SME focus on the use and application of IT in business organizations. Several studies have attempted to identify the use of IT accounting systems in SME specifically, but are very limited for studies. These findings do not examine the relationship between indicators of adoption and IT used in the accounting system and the factors that influence its use (e.g., Ismail et al., 2003; Popovič, Puklavec, & Oliveira, 2019). Therefore, this study aims to provide empirical evidence of the computer-based accounting systems (CBAS) maturity model for SMEs in Indonesia,

especially in Semarang city. Some research questions that can be developed include: how is the identification and level of adoption of CBAS between SMEs and the maturity level of CBAS taken between SMEs. The results of this study will serve as important indicators for the readiness of SMEs.

2. Review of Literature

2.1. The Role and Existence of Small and Medium Enterprises (SME)

SMEs are business units managed by community groups and families. Data published by the Ministry of Cooperatives and SMEs show that the number of SMEs at the end of 2016 is 58.2 million units and continues to increase. Absorption of labor can reach 97.04% of the total employment in Indonesia. The development of SMEs in Central Java with the number of SMEs at the end of 2016 is 80,853 units.

SME has a strategic role in developing all business, but quite complex problems constrain it. SME in Indonesia carries out its business activities using traditional methods. On the other hand, companies compete through the use of sophisticated IT technology to win the competition. IT also plays an important role in quality economic decision making (Haryani, 2012). Small business managers and cooperatives stated that they did not have accounting knowledge, and many of them did not understand the importance of recording and bookkeeping for business continuity. Small entrepreneurs see that the accounting process is not too important to apply. The same goes for SME in Semarang, where, in reality, most SMEs have not organized and used accounting in managing their businesses (Achjari, Abdillah, Suryaningsum, & Suratman, 2011).

2.2. The Need for Computer-Based Accounting Systems (CBAS) for SMEs

SMEs, as other profit organizations, are expected to strive to achieve profitability through the value of product or service quality competitiveness. According to the globalization of trade, investment, and dynamic technology, SME is forced to prepare facing competition (Matrane et al., 2015). Therefore, it is possible if financial resources and the use of technology are relevant, among other factors, available and adequate, cost-effective, and properly used (Louadi, 2009). In recent market competition, SME needs to recognize that IT has the potential to increase productivity, quality, and performance that are important for their survival and success. SME also needs non-financial information, such as price changes, market trends, and customer behavior to survive and grow (Chenhall & Morris, 1986).

Apart from various government programs and incentives, including the application of technology and competence in human resources building, the effectiveness of IT adoption among SME is still an issue of great concern to the government. The studies of Adams et al. (2011), Ismail et al. (2003), Rahayu & Day (2015), for example, found that IT adoption among SME was only 51%, which used computers for accounting and financial purposes. Ingirige, Bingunath, Wedawatta (2018) found that over 86% of small companies established in the UK had a computerized accounting system.

The slow adoption rate is an important issue because SMEs make up the majority of manufacturing in Indonesia as a developing country. One possible explanation for the low adoption rate is the alarming attention of most SME owners to IT (Turner & Endres, 2017) because their technical understanding is relatively low (Zhou, 2016), or they are not aware of incentives offered by institutions.

The progress of IT has created a new generation of computerized accounting outside the high-end system, namely, ERP (enterprise resource planning). ERP system is an integrated software package designed to provide complete integration of business system organizations to processing information and all related data (Rodríguez-Ardura & Meseguer-Artola, 2010). ERP systems will further strengthen the company's strategic position with the availability of information that can support management decision-making processes. Despite the availability of several fully integrated software empirical evidence so far, however, it reveals that SME tends to use computers primarily to support operational or administrative tasks, not to make strategic decisions (Maguire, Koh, & Magrys, 2007; Rahayu & Day, 2015). Among the popular software modules used by SME are basic accounting modules such as ledgers, accounts payable, accounts receivable, and payroll. The findings show that SME has not fully used the available technology offered by the latest accounting software systems to produce strategic information.

2.3. Adoption and Maturity of CBAS Research

CBAS is classified into two main categories, namely low-end and high-end systems. The characteristics that distinguish are the ease and speed of information. Information is taken from the accounting database, the quantity of information that can be stored in the database, the intensity of use, and ease of modification and customization (Grover & Kar, 2017). Moreover, it found the main aspects of the company to determine the extent of IT used in accounting, which includes the level of computerization, the type of IT-based systems used, the type of IT applied, workstations to staff, and years of using IT. Result by Mohd Sam, Hoshino, & Hayati Tahir (2012) shows that more than 94% of these companies are fully or most of their computerized accounting systems, while 50% have at least some IT applications integrated into accounting. They also found that the level of computerization was greater in large companies than small and medium-sized companies.

The finding of Powell (1996) confirmed the other previous studies, which argued that the size of the company as a determinant of the level of sophistication (e.g., DeLone, 1981; Lees, 1987; Thong & Yap, 1995). A study by Hunton & Beeler (1997) found that firm size is significantly negatively correlated, even though weakly, with the level of IT used in accounting. They suggest that differences may be caused by lower capital and risk barrier (Azam & Quaddus, 2009) due to dramatic decreases in IT costs. Companies of all sizes can benefit from the latest IT development. Another possible explanation is that midsize companies may have developed from small companies. Otherwise, their managers may have limited capabilities, namely time and education, to appreciate the benefits of using an integrated accounting system. Powell (1996) subsequently found that 80% of companies were almost or fully satisfied with their IT-based accounting system. Nearly 90% stated that their IT application objectives were fully or almost satisfied. The confirmed findings were found by Shahrum et al. (1996). In another related study, research by Duschinsky & Dunn (1998) in established small companies in the UK shows that 86% of companies have a computerized accounting system. The same percentage of companies use IT for invoices; 73% for management reporting; 66% for payroll and 58% percent for marketing.

However, another research conducted by Chen (1993) offers results in different directions. They found that only 55% of small-scale enterprises or agricultural handicrafts located in rural areas in East England had used microcomputer systems. This evidence could indicate that geographical location and type of business sector might have a significant impact on the use of IT among SMEs. Besides, the decrease in computer hardware and software costs, availability and ease of use of computers, and better software packages could cause an increase in the number of computer accounting installations in smaller and medium-sized organizations (James Y.L. Thong, 1999).

Evidence about the use of IT among SMEs is still inconsistent. Even small businesses in the same country do not show a similar pattern of adoption. This is because SME is not

regulated and the need for timely financial reporting. It has pressing compared to large companies too that IT adoption depends on the type of business and IT management awareness and its benefits. In addition, the nature of the business becomes less complex. SME shows a greater tendency to buy commercial accounting packages. That is much cheaper than internal and external packages tailored to the needs (Gray, 1991). Turner & Endres (2017) was confirmed this finding among Indonesian SMEs. Generally, SME is experienced in running their business, but lack knowledge in information systems. Therefore, most SME always turns to external experts to help. Unfortunately, external experts may have very little understanding of the nature of the company and business. Thong & Yap (1995) propose a concerted effort to enhance cooperation between SME and external expertise to help SME to obtain technology transfer. Matrane et al. (2015) revealed that IT adoption maturity, in this case, the CBAS concept was determined by (1) business management, (2) risk management, (3) operations management, (4) incident management, and (5) problem management in implementing IT adoption. This determination will be described in indicators of achievement of maturity. That will place each SME in the group at the level of implementation, development, and capability in developing a better business strategy.

The structure of maturity model is built upon the following dimensions (Matrane et al., 2015), i.e., *Level 1 (initial):* there is no process area; *Level 2 (defined):* implementation processes are documented, standardized, and integrated into a standard implementation process for the organization; and *Level 3 (managed):* Process and activities are controlled and managed based on quantitative models and tools. A maturity model for information systems gives the possibility for managers of organizations to see where it stands and how it can improve the information system. Thus, it provides a methodology for an organization to develop an improvement roadmap to its information system. The new maturity model for information security management is composed of five distinct phases that encompass historical practices and future aspirations (Matrane, Talea, & Okar, 2014). It is further called a five management (5M) of information security.

1. *Level 1: Business Management*
   This is to synthesize the key objectives and resources that must be protected to achieve them. This allows us to integrate the security into all the processes and structures and to support external requirements (regulatory compliance) and internal (business lines, policies).
2. *Level 2: Risks Management*
   This is to quantify the actual level of risk and bring closure to the acceptable level by the company. This helps to identify, order risk, and control projects to reduce risk.
3. *Level 3: Operations Management*
   This is to evaluate the daily running of security operations and their ability to provide an optimum ratio cost / security. This aligns processes and controls policies to reduce the rate of conversion of risk in incidents.
4. *Level 4: Incidents Management*
   This is to assess the ability of the company to respond to security incidents to ensure that the level of risk tolerance is never exceeded. This allows detecting, analyzing, processing, and communicating security events to minimize the effects and costs of resolution. It is vital to be able to detect and analyze very quickly for taking appropriate measures to limit its impact.
5. *Level 5: Problems Management*
   A 'Problem' is the unknown cause of one or more incidents, often identified as a result of multiple similar incidents. The objective of Problem Management is to minimize the impact of problems of security on the organization. Problem Management plays an important role in the detection and providing solutions to problems (workarounds & known errors) and prevents their reoccurrence.

3. Research Methodology

3.1. Population and Sample

The population of this study was SMEs in the Semarang city, which were identified as using IT in their business in the amount of 608 data. The procedure for determining the sample was carried out with purpose random sampling. The sampling used by choosing the managers of SMEs that are registered in the data of the economic census of the Badan Pusat Statistik in 2015 with a turnover reaching to scales of 120 small companies scattered in the city of Semarang, especially for the financial and service industries. The financial services sector is considered information sensitive, and it is expected to provide the widest use of IT because of the presence of all major business functions (Raymond & Magnenat-Thalmann, 1982).

3.2. Instruments and Data Collection

The developed questionnaire was divided into three main parts. The first part, which is in the general background, includes company background and ownership, legal status, type of industry, year established, number of employees, and total income for the previous fiscal year. The second part investigates the adoption and extent of CBAS used. Five IT adoption maturity instruments were taken from Matrane et al. (2015):

1. *Business management*, including indicators of the definition of business objectives, the level of business risk, and important business resources;
2. *Risk management*, including indicators of understanding internal and external barriers, identification of fraud, and the classification of resources with high values;
3. *Operations management*, including priority work indicators based on risk, increased awareness of security, the need for supervision and ratification of the system;
4. *Incident management*, including indicators of identification of events, priorities for business impacts, and reporting on business managers;
5. *Problem management*, including indicators of neglect of incidents that have occurred, minimizing the impact of the problem, initiating events that might be repeated.

Primary data in the form of questionnaires are submitted to SMEs by mailing and direct filling to increase the rate of return. Mailing questionnaires are returned within a certain date to be processed and analyzed.

3.3. Data Analysis

Respondents measured the third part of the perception of the quality of the computerized accounting system adopted in connection with the content, accuracy, format, and timeliness. This dimension will provide evidence of the extent to which the output of CBAS is considered useful for the end-user. In this study, end-users are leaders of sample SME who use the output of accounting systems to make business decisions. Responses to grains were recorded on a five-point Likert scale. The test begins with a non-response bias test to determine the difference in the respondent's answers before and after the date of the questionnaire return limit. Testing the level of adoption of CBAS for five instruments uses Spearman Correlation for alpha 5%, with higher values indicating high intensity.

4. Results

The SMEs of Semarang city was identified as a research sample of 120 companies, which are engaged in the financial and service industries. The unit of analysis that is the respondent is SME leaders or managers who use the output of the accounting system to make business decisions. The submission of questionnaires is made directly to respondents to ensure a high rate of return. When the collection deadline is set, the

questionnaire collected is 98 copies, with a response rate of 81.67%. In addition, there are no questionnaires returned after the set time, so there was no need for a non-response bias test. The description of the respondent's answers is presented in the following table.

Variable	Value Description Maturity			
	Minimal	Maximal	Average	Standard Deviation
PO 1	1.00	4.00	3.08	0.176
PO 2	2.00	4.00	3.34	0.059
PO 3	2.00	4.00	3.39	0.056
PO 4	2.00	4.00	3.43	0.061
ME 1	1.00	4.00	3.04	0.181
ME 2	2.00	4.00	3.39	0.256
ME 3	2.00	4.00	3.39	0.156
BM	2.00	4.00	3.39	0.167
RM	1.00	4.00	3.04	0.057
OM	2.00	4.00	3.42	0.390
IM	1.00	5.00	3.34	0.170
PM	2.00	4.00	3.47	0.055
SI	2.00	4.00	3.46	0.157
SZ	2.00	4.00	3.63	0.256
CO	2.00	5.00	3.64	0.050
CI	2.00	4.00	3.31	0.152

Table 1. Description of Respondents

Based on the findings, it can be described: first, the minimum limit is one in four variables (PO1, ME1, RM, IM) that indicate there is no activity to develop determined innovations. The minimum limit mode is two, which indicates that some documents support activities to develop determined innovations that are routines operational. Second, the maximum limit is five in two variables (IM, CO) indicate there are documents, processes, and development activities that are very well managed, widely known and implemented as good practices and implementation constraints are managed well. Minimum limit mode is four different conditions (PO1, ME1, RM, IM) with a value of five in conditions not widely known and implemented well and routinely. The three average values range more than 3 (RM, PM, CO) with a standard deviation of less than 0.6, which indicates a relatively low limit so that the condition of maturity shows: there are documents, processes, and development activities that are very well managed. The condition is widely known and implemented as good practices, but there are still implementation constraints that need to be managed properly.

Subsequent findings related to the computerized quality of accounting systems were adopted in connection with the content, accuracy, format, and timeliness of the conditions of SME system maturity. This dimension will provide evidence of the extent to which the output of CBAS is considered useful for the end-user. Testing on the dimensions of CBAS on the condition of SME system maturity, with correlation showing the following results (Table 2).

Based on Table 2 with the Spearman Correlation method, it shows that: first, there are several variables of the level of adoption of CBAS which correlate above 0.60 with the CBAS maturity variables including variables: planning and organization (PO = 0.609), business management (MB = 0.627), risk management (MR = 0.806), problem management (MM = 867), standardization (ST = 0.668) and measurement (UK = 0.770); second, a correlation of more than 0.6 at a significance of 0.05 indicates a high perceptional relationship between the CBAS adoption level variable to the CBAS maturity dimension; third, the highest correlation of the CBAS adoption level variable to the CBAS maturity dimension is reflected in the problem management variable (0.806). This shows that the very high maturity dimension of CBAS is related to problem management perceived and faced by SME.

Variable	PO	ME	BM	RM	PM	IM	MM	ST	SZ	CO	CI	MS
PO	1.000	0.305	0.466	0.305	0.712	0.492	0.657	0.241	0.223	0.398	0.756	0.609
ME		1.000	-0.50	0.246	0.674	0.304	0.876	0.641	0.871	0.451	0.431	0.348
BM			1.000	0.291	-0.38	0.691	-0.57	0.539	0.761	0.765	0.566	0.627
RM				1.000	0.447	0.591	0.991	0.601	0.545	0.551	0.811	0.806
PM					1.000	0.871	0.765	0.403	0.076	0.546	0.762	0.402
IM						1.000	0.657	0.567	0.362	0.771	0.234	0.505
MM							1.000	0.387	0.221	0.547	0.761	0.867
TS								1.000	0.341	0.331	0.541	0.668
SZ									1.000	0.268	0.165	0.770
CO										1.000	0.817	0.520
CI											1.000	0.230
MS												1.000

Notes:
PO: planning and organization, ME: monitoring and evaluation, BM: business management, RM: risk management, PM: operational management, MI: incident management, MM: problem management, ST: standardization, SZ: size, CI: continuous development, MS: CBAS system maturity

Table 2. Correlation of System and Dimension of CBAS

5. Discussion

CBAS maturity level in Semarang shows the condition on the third level. That means CBAS has documents, processes, and development activities that are well managed, widely known, and implemented. As good practices, there are still implementation constraints that need to be managed properly. This condition is supported by further findings that some conditions of CBAS adoption are highly correlated with the CBAS maturity level. Constraints still need to be controlled at maturity level 3. The condition showed that of system planning and organization towards business, business management patterns, concern for risk management in information technology-based business is a great concern for CBAS maturity level (Matrane et al., 2014).

The CBAS adoption rate of SMEs shows that it is influenced by some indicators include business planning and organization, business management patterns, concern for risk management in information technology-based business, management processes for business problems, standardization of documentation and reporting, and measurement of business data. High relationships in planning and organization are not followed by a monitoring and evaluation (ME) process and high operational management (MO), which SME suspicion do not prioritize. A presumption notes that SMEs in running a business lacks knowledge in information systems, especially their operational processes. Therefore, most SME always turns to external experts to help implement CBAS. Unfortunately, external experts may have very little understanding of the nature of the company's business. Thong, Yap, & Raman (1996) propose a concerted effort to enhance cooperation between SME and external expertise to help SME to obtain technology transfer.

These findings alter the result of Matrane et al. (2015) that IT adoption maturity, in this case, the CBAS concept was determined by (1) business management, (2) risk management, (3) operations management, (4) incident management, and (5) problem management in implementing IT adoption. These findings focus on security management, business management, risk management, and problem management. The determinant

show is high variables related to the maturity level of CBAS. SME is aware of the need and importance of the security level of CBAS in the business being run.

The development of CBAS adoption for SMEs is directed, not only to use systems and information technology but to manage better and control business-based management planning and organizing good resources, business management based on business risk management and handling good business problems and data standards consistent business base. This supports the findings of Honig (1999) that CBAS is not only about the ease and speed of information taken from the accounting database. The information quantity can be stored in the database, the intensity of use, and ease of modification and customization (Spivak, W., & Honig, 1997) but also patterned as a corporate resource-planning (ERP) model. An ERP system is an integrated software package designed to provide complete integration of business system organizations to processing information and all related data (Venkatraman & Fahd, 2016).

6. Conclusion

This study concludes that the maturity level of the SMEs accounting system at the third level (defined) have been determined, but are not yet optimal. Key maturity activities are significantly related to planning and organization, business process management, risk management, and problem management, as well as system standardization and measurement.

Some suggestions for SMEs in the Semarang city to develop the accounting systems include: (1) paying attention to important indicators for the readiness of SME to face future challenges by adopting IT, which can accelerate the preparation of timely financial reports, namely: planning and organization, business management, risk management, problem management, standardization and measurement of business database; and (2) paying more attention to the obstacles faced in the intensity of the use of information and communication technology in the development of CBAS.

References

[1] Achjari, D., Abdillah, W., Suryaningsum, S., & Suratman. (2011). Kesiapan Usaha Mikro, Kecil dan Menengah Industri Kreatif Untuk Mengadopsi Teknologi Informasi. *Jurnal Akuntansi Dan Auditing Indonesia*, 15(2), 143-160.

[2] Adams, M. A., Armstrong, A., Clarke, A., Clarke, T.; Eddie, I. A., Heenetigala, K., Richardson, A. (2011). *Developing a Responsive Regulatory System for Australia's Small Corporations: Governance for Small Business*. Victoria University, Melbourne, Vic.

[3] Ardiansah, M. N. (2011). Pengaruh Karakteristik Koperasi Terhadap Permintaan Jasa Audit Eksternal: Studi Empiris Koperasi Di Kota Semarang. *Jurnal Informasi, Perpajakan, Akuntansi, Dan Keuangan Publik*, 6(2), 71-82. https://doi.org/10.25105/jipak.v6i2.4483

[4] Azam, M. S., & Quaddus, M. (2009). Adoption of E-Commerce by the SMEs in Bangladesh: the Effects of Innovation Characteristics and Perceived Risk. In *Proceedings of the Australian and New Zealand Marketing Academy Conference (ANZMAC)*. New Zealand.

[5] Badan Pusat Statistik. (2017). *Indonesia Statistic Reporting*.

[6] Ballantine, J., Levy, M., & Powell, P. (1998). Evaluating Information Systems in Small and Medium-Sized Enterprises: Issues and Evidence. *European Journal of Information Systems*, 7(4), 241-251. https://doi.org/10.1057/palgrave.ejis.3000307

[7] Brecht, D. H. ., & Martin, M. P. (1996). Accounting information systems: The challenge of extending their scope to business and information strategy. *Accounting Horizons*, 10(4), 16-22.

[8] Chen, J. C. (1993). The Impact of Microcomputer Systems on Small Businesses: England, ten years later. *Journal of Small Business Management*, 31(3), 96-112.

[9] Chenhall, R. H., & Morris, D. (1986). The Impact of Structure, Environment, and Interdependence on the Perceived Usefulness of Management Accounting Systems. Source: *The Accounting Review*, 61(1), 16-35.

[10] Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-340. https://doi.org/10.2307/249008

[11] DeLone, W. H. (1981). Firm Size and the Characteristics of Computer Use. *Proceedings of the International Conference on Information Systems*, 5(4), 327-329.

[12] DeLone, W. H., & McLean, E. R. (2004). Measuring e-Commerce Success: Applying the DeLone & McLean Information Systems Success Model. *International Journal of Electronic Commerce*, 9(1), 31-47. https://doi.org/10.1080/10864415.2004.11044317

[13] Duschinsky, P., & Dunn, P. (1998). Competitive advantage from IT. *Charter News*, The Institute of Chartered Accountants

[14] Elliott, R. K. (1992). The Third Wave Breaks on The Shores of Accounting. *Accounting Horizons*, 6(2), 61-73.

[15] Gray, G. L. (1991). Accounting Information System Selection in Small Organizations: Incongruences between accounting Accounting Professionals. *Journal of Information Systems*, 5(1), 17-35.

[16] Grover, P., & Kar, A. K. (2017). Big Data Analytics: A Review on Theoretical Contributions and Tools Used in Literature. *Global Journal of Flexible Systems Management*, 18(3), 203-229. https://doi.org/10.1007/s40171-017-0159-3

[17] Haryani, E. (2012). Accounting System for Small Business in Indonesia (Case Study Convection Business in Tingkir Lor Village). *Journal of Arts, Science and Commerce*, 2(4), 104-112.

[18] Honig, S. A. (1999). The Changing Landscape of Computerized Accounting Systems. *The CPA Journal*, 69(5), 14-21.

[19] Hunton, J. E., & Beeler, J. D. (1997). Effects of User Participation in Systems Development: A Longitudinal Field Experiment. *MIS Quarterly*, 21(4), 359. https://doi.org/10.2307/249719

[20] Ingirige, Bingunath; Wedawatta, G. (2018). The Sociotechnical Constitution of Resilience: A New Perspective on Governing Risk and Disaster. Singapore: Springer Singapore. https://doi.org/10.1007/978-981-10-8509-3

[21] Ismail, N. A., Abdullah, S. N., & Tayib, M. (2003). Computer-Based Accounting Systems: The Case of Manufacturing-Based Small and Medium Enterprises in the Northern Region of Peninsular Malaysia. *Jurnal Teknologi*, 39(1), 19-36. https://doi.org/10.11113/jt.v39.473

[22] Kartiwi, M., Hussin, H., Suhaimi, M. A., Mohamed Jalaldeen, M. R., & Amin, M. R. (2018). Impact of External Factors on Determining E-Commerce Benefits Among SMEs in Malaysia. *Journal of Global Entrepreneurship Research*, 8(1), 18. https://doi.org/10.1186/s40497-018-0105-7

[23] Lees, J. D. (1987). Successful Development of Small bBusiness Information Systems. *Journal of Systems Management*, 38(9), 32-39.

[24] Louadi, M. El. (2009). The Relationship among Organization Structure, Information Technology and Information Processing in Small Canadian Firms. *Canadian Journal of Administrative Sciences*, 15(2), 180-199. https://doi.org/10.1111/j.1936-4490.1998.tb00161.x

[25] Maguire, S., Koh, S. C. L., & Magrys, A. (2007). The adoption of e-business and knowledge management in SMEs. *Benchmarking*, 14(1), 37-58. https://doi.org/10.1108/14635770710730928

[26] Matrane, O., Talea, M., & Okar, C. (2014). Towards A New Maturity Model for Information System. *International Journal of Advanced Research in Computer Science and Software Engineering Computer Science and Software Engineering*, 4(6), 71-78.

[27] Matrane, O., Talea, M., & Okar, C. (2015). Towards A New Maturity Model for Information System. *International Journal of Computer Science Issues*, 4(6), 71-78.

[28] Mohd Sam, M. F., Hoshino, Y., & Hayati Tahir, M. N. (2012). The Adoption of Computerized Accounting System in Small Medium Enterprises in Melaka, Malaysia. *International Journal of Business and Management*, 7(18), 12-25. https://doi.org/10.5539/ijbm.v7n18p12

[29] Montazemi, A. R. (1988). Factors Affecting Information Satisfaction in the Context of the Small Business Environment, *MIS Quarterly*, 12(2), 239-256.

[30] Popovič, A., Puklavec, B., & Oliveira, T. (2019). Justifying business intelligence systems adoption in SMEs: Impact of systems use on

firm performance. *Industrial Management and Data Systems*, 119(1), 210-228. https://doi.org/10.1108/IMDS-02-2018-0085
[31] Porter, M. E. ., & Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review*, 64(3), 149-160.
[32] Powell, P. (1996). The extent, mode and quality of IT use in accounting. *Journal of Applied Management Studies*, 5(1), 143-158.
[33] Rahayu, R., & Day, J. (2015). Determinant Factors of E-commerce Adoption by SMEs in Developing Country: Evidence from Indonesia. *Procedia - Social and Behavioral Sciences*, 195, 142-150. https://doi.org/10.1016/j.sbspro.2015.06.423
[34] Raymond, L. (1985). Organizational Characteristics and MIS Success in the Context of Small Business. *MIS Quarterly*, 9(1), 37. https://doi.org/10.2307/249272
[35] Raymond, L., & Magnenat-Thalmann, N. (1982). Information Systems in Small Business: Are They Used in Managerial Decisions? *American Journal of Small Business*, 6(4), 20-26. https://doi.org/10.1177/104225878200600405
[36] Rodríguez-Ardura, I., & Meseguer-Artola, A. (2010). Toward a longitudinal model of e-commerce: Environmental, technological, and organizational drivers of B2C adoption. *Information Society*, 26(3), 209-227. https://doi.org/10.1080/01972241003712264
[37] Seyal, A. H., Rahim, M. M., & Rahman, M. N. A. (2000). An Empirical Investigation of Use of Information Technology among Small and Medium Business Organizations: A Bruneian Scenario. *The Electronic Journal of Information Systems in Developing Countries*, 2(1), 1-17. https://doi.org/10.1002/j.1681-4835.2000.tb00014.x
[38] Shahrum, H. ., Soa'ad, S. S. ., Engku, A. B. ., Kamran, S. ., Sabri, A. ., & Zurni, O. (1996). *IT Adoption among the Small and Medium Enterprises in the Northern Region of Peninsular Malaysia*. Research Report for IRPA Project. Sintok.
[39] Spivak, W., & Honig, S. (1997). PC-based Client-server Accounting Systems. *The CPA Journal*, 67(11), 14.
[40] Storey, D. J., & Cressy, R. (1996). *Small Business Risk: A Firm and Bank Perspective*. Centre for Small and Medium Sized Enterprises, Warwick Business School.
[41] Thong, J.Y.L., & Yap, C. S. (1995). CEO Characteristics, Organizational Characteristics and Information Technology Adoption in Small Businesses. *Omega*, 23(4), 429-442. https://doi.org/10.1016/0305-0483(95)00017-I
[42] Thong, James Y.L. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187-214. https://doi.org/10.1080/07421222.1999.11518227
[43] Thong, James Y.L., Yap, C. S., & Raman, K. S. (1996). Top Management Support, External Expertise and Information Systems Implementation in Small Businesses. *Information Systems Research*, 7(2), 248-267. https://doi.org/10.1287/isre.7.2.248
[44] Turner, S., & Endres, A. (2017). Strategies for Enhancing Small-Business Owners' Success Rates. *International Journal of Applied Management and Technology*, 16(1), 34-49. https://doi.org/10.5590/IJAMT.2017.16.1.03
[45] Venkatraman, S., & Fahd, K. (2016). Challenges and Success Factors of ERP Systems in Australian SMEs. *Systems*, 4(2), 20. https://doi.org/10.3390/systems4020020
[46] Zhou, B. (2016). Lean principles, practices, and impacts: a study on small and medium-sized enterprises (SMEs). *Annals of Operations Research*, 241(1-2), 457-474. https://doi.org/10.1007/s10479-012-1177-3

The Analysis of the Efficiency of e-Learning Training Program in Pharmaceutical Industry. A Romanian Study Case

Petruța BLAGA[1], Manuela Rozalia GABOR[2*], Cosmin MATIS[3]

[1]"George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology of Targu Mures, Economics Sciences Department, Gh. Marinescu Street, no. 38, 540139, Mures County, Romania; E-mail: petruta.blaga@umfst.ro
[2]"George Emil Palade" University of Medicine, Pharmacy, Sciences and Technology of Targu Mures, Economics Sciences Department, Gh. Marinescu Street, no. 38, 540139, Mures County, Romania; E-mail: manuela.gabor@umfst.ro; rozalia_gabor@yahoo.com
[3]Babes-Bolyai University of Cluj, Faculty of European Studies, 400084, Cluj-Napoca, Romania; E-mail: cosmin.matis@ubbcluj.ro
[*]Corresponding author

Abstract

This paper aims to evaluate the impact of the e-learning training programs on the performances and organizational changes from the pharmaceutical sector/organization. We perform a return on investment analysis, respectively the evaluation of the investment efficiency in human resources, most of the managers considering training more of as a cost rather than an investment. We used collecting data process to determine the incidence of cost of e-learning training program. Our results show a positive return on investment (1.19 Lei) confirming international results. The present paper represents a final part (Level 5 of Phillips' model) of a complex research made by the authors in the last years. With these results we offer a first full Romanian study case in pharmaceutical industry using data from a leader organization. This research fills a gap in the literature and highlights (not only for pharmaceutical industry but also for Romanian organizations) the necessity to measure the impact of training programs on performance and organizational changes. This is the first and complete research performed in Romania for the pharmaceutical sector, highlighting the benefits of bridging practice and theory and the need for continuous training program evaluation of the performance improvement initiatives.

Keywords: *ROI methodology; human resources training; e-learning; performance; management; Romanian Pharmaceutical Organization.*

1. Introduction

The development of economy and technique, the fast transformation of the social environment and of the organizations, the increase of social responsibility and human resources (HR) mobility, and the change of industrial psychology represent significant aspects that highlight the importance of HR for an organization. Also, the main sustainability implementation drivers are rooted in personal and organizational values (Kiesnere and Baumgartner, 2019). In the context of globalization, continuous significant changes of the business environment occur, determining mutations in the qualification of the HR and their management. Management literature has identified high-skilled human capital as a crucial dimension of innovation processes at the firm level (Fonseca, de Faria and Lima, 2019) and of the organizational changes for sustainable human resources. On the other hand, the knowledge society are pressure factors on changes both in the structural organization of companies, in the structure and the quality of HR but also in the human resources management (HRM) (Muscalu and Muntea, 2014), development being based on the human resources (Manole and Alpopi, 2013). Today HRM has a unique and timely opportunity to improve productivity (Kumpikaite, 2007).

The last years e-learning has become a special subject, treated with real interest by both *education institutions and organizations* (Susanu, Cristache and Micu, 2010) but also, there are still concern regarding Return on investment (ROI) of e-learning, its sustainability within organization (Rentroia-Bonito, Goncalves and Jorge, 2015). The actual global economy requires the harmonization of some cultures, structures and different policies. If in the past HRM did not consider the aspect of harmonization, nowadays the HRM has as specific aim, respectively, the education, training and development, to be able to cope successfully with an international career. In the context of globalization, HR has gained a key role, being considered a "strategic partner" that can decisively influence the strategy of developing and expanding multinational companies.

Employee training is not only important for the continuous growth of HR but also guarantees sustainable human resource management in enterprises (Zhang et al., 2019). The capability of organizations to accumulate and apply new knowledge is a key factor in order to achieve the new competitive standards (Blaga and Gabor, 2014; 2016). International environment does not appear the same for all organizations, in terms of competition, accessibility, opportunities.

In the global and (for Romania, i.e.) European Union context of both the number and quality of HR acquired new dimensions. HRM creates additional value for the companies which recognize and implement HR activities in an adequate way (Slavic and Berber, 2019). The profound changes in the mana-

gement of Romanian organizations as a result of the transition have imposed (during the last 30 years) many strategic and organizational challenges to evaluate their performances. One of the most dynamic areas of production in Romania is the pharmaceutical sector. In this sector the decisional implications refer to financial resources, HR, investments, know-how, the adaptation to the national and international health programs etc. Thus, in this sector, HRM plays a strategic role at the level of a multinational companies and consists of several activities, such as HR planning, staffing, compensation, performance management, training and development (Slavic and Berber, 2019). At the level of organizations, the function of HR has made remarkable series of progress in fields such as HR development, career management and employee motivation. The presence of HR managers in the board of multinational companies is the most important proof of their involvement in the strategic decision-making process. Among mentioned HR activities, training and development of employees represent one of the most important and basic HR activities (Slavic and Berber, 2019).

These global trends are identified in Europe (Blaga, 2012a), where the development of the European Union market and the opening of Eastern Europe have led and would lead to many changes in the HRM in every European country (Blaga, 2012b). An actual training system becomes thus a necessity for any organization maintaining to have professional standards of its own HR. The aim of the training is to create sustainable change in behaviour and understanding so that individuals with new competences can perform their working tasks, activities and processes (Slavic and Berber, 2019). Therefore, organizations spend a significant part of their budgets for the training of own staff. With the rising costs of training increasingly advanced, many organizations try to determine the value of training on the employees' performance and on the continuous growth of the organization. This is generally evidenced by the return on investment (ROI) in HR training. In the current economic context, in which the function of HR is becoming more as a strategic function and costs have become a priority in the setting of the strategies, evaluating the efficiency of investment in HR is becoming an important and up to date topic. The importance of evaluating HR development initiatives in an organization lies in measuring the investment return in such programs. Budgets allocated to HR departments; competition, profitability and lack of qualified HR have increased the importance of evaluating the HR training initiatives. Most managers have realized that learning is a basic necessity (Beardwell and Claydon, 2007) when organizations experience significant growth or competition intensifies.

In the current competitive context, the training of HR is of major importance in order to increase the performance and development of the company. Organizing some training programs bring many benefits to organizations due to the fact that the employees develop their knowledge, skills and abilities. By making work more interesting, these programs increase the level of the employees' motivation and lead them to a positive attitude towards their daily activities.

Based on the above mentioned, this paper aims to evaluates the impact of the e-learning training program (made through university – organization partnership) on the performances and organizational changes from the pharmaceutical sector/organization using the ROI Methodology, respectively the evaluation of the investment efficiency in HR training through e-learning, most of the managers considering training more of as a cost rather than an investment (Babapour, Gholipour and Mehralian, 2018). The organizations have realized the importance of HR training and now have even passed traditional education and taken e-learning for developing their human resources (Gharibpoor, Sargazi and Aref, 2013) using partnerships with educational institutions, i.e. the universities.

The present research represents a final part (Level 5 of Phillips ROI Methodology approach) of a complex research made by the authors in the last years during on the university – organization partnership for the traditional and e-learning training program. In Table 1 we mentioned (in the last column) the own references linked to each steps with published results according to Kirkpatrick' and Phillips' ROI Methodology. With these results we complete the entire Kirkpatrick' and Phillips' models and offer a first full Romanian study case in pharmaceutical industry using for collecting data a leader organization (Khan, Pramjeeth and Kader, 2018). With these results we fill a gap in the international literature and highlight (not only for pharmaceutical industry but also for Romanian organizations) the necessity to measure the impact of training programs on organization performance and organizational changes.

2. Literature Review

2.1. Measuring effectiveness of human resources training programs and the impact on the organization

In the last years, the development of human capital is growing, representing an important "engine" of the economic growth. The role of education and training in HR development is obvious lately and changing (Albulescu and Dascălu, 2013), which is why professional education and training should have certain priorities given the high and continuing pace of growth in demand for new skills on the labour market. In an increasingly competitive world, the success of the company depends on the efficient usage of human capital, respectively those skills and competences that facilitate competitive behaviour and performance (Velciu, 2014). Therefore, they need to measure the return on investment in employee training courses (Bele et al., 2015).

In particularly in Romania (Velciu, 2014), companies are designing their training policies according to their own needs, to improve their performance, competitiveness (Albulescu and Dascalu, 2013) or to ensure their success; they want not to spend needlessly their resources and ensure a ROI (Velciu, 2014). To progress and survive in the competition, organizations need to increase their efficiency and competitiveness of HR by raising the level of training and evaluating the efficiency of investment in the HR training. In order to be effective and successful, HR training programs must meet certain conditions (Boardman et al., 2004) and HRM should focus on some key points (Armstrong, 2006).

In the international literature, we found other studies that refer to the importance of the evaluating the effectiveness of investment in human capital but for e-business enterprises in the context of sustainability (Kucharcikova, Miciak and Hitka, 2018) not for a type of training (traditional and/or e-learning) or specific sector or with complementary investments of human capital, i.e. research and development, physical capital and advertising (Riley, Michael and Mahoney, 2017).

It is very important to evaluate the effectiveness of this investment, to estimate the detention of the time, the money flows: incomes (revenues) and outcomes (expenditures) (Giziene, Simanaviciene and Palekiene, 2012). When e-learning courses are conducted in the context of companies, managers are primarily interested in the effects of the e-course on the skill sets of their employees (Bele et al., 2015).

2.2. ROI Methodology – particularities and adaptation for the research study case

Developed in the 1970s, improved through applications and uses in the 1980s and implemented globally throughout the 1990s, the ROI model of Phillips (Phillips, 1991; 1996a; 1996b; 1996c; 1998), based on five evaluation levels of the training makes important improvements in getting measurable results relative to the effectiveness of training programs by establishing objectives accepted by the management of the organization, learners and instructors. In financial terms, one of the most used

measuring methodologies of the impact for of HR training on indicators performances of an organization is the ROI methodology, developed by Phillips.

The specific applications of the ROI were used at the beginning in the manufacturing sector and now in the educational sector (Phillips, 2003). More recent applications aimed to measure the ROI in the case of some graduation programs, in the teachers' training, in the case of some continuing education programs in universities, for optimizing the mix of television advertising and in-store marketing (Harvey et al., 2012), for cloud computing (Perng and Chang, 2012), to measure the faculty perceptions of the value and the economic benefits of electronic journal collections for faculty research in terms of ROI (Pan et al., 2013), cultural services – libraries (McIntosh, 2013), for PHM activities (Feldman, Jazouli and Sanborn, 2009), EES process (Arjunan, 1991), in watershed conservation (Kroeger et al., 2019), health (van Katwyk et al., 2019; Aguilar-Agudo et al., 2019), charities (Bellucci et al., 2019), public education (Palos and Pedro, 2016) and even e-learning training (Rentroia-Bonito, Goncalves and Jorge, 2015; Sharma and Garg, 2016; Selviandro, Suryani and Hasibuan, 2015; Yi, Zuo and Wang, 2007; Berredo and Soeiro, 2004).

According to Kirkpatrick there are four evaluation levels of some HR education programs in business (Kirkpatrick, 1959a; 1959b; 1960a; 1960b; Kirkpatrick and Kirkpatrick, 2005; 2006). Continuing the issues approached by Kirkpatrick (Kirkpatrick, 1994; 1998), Phillips has emphasized an evaluation methodology of HR training programs in five stages (Phillips, 1991; 1996a; 1996b; 1996c; 1998; 2003; 2007; 2008; Phillips et al., 2007; Phillips and Phillips, 2010) (Table 1). The present results being a final part of a complex research made by the authors in the last years, we mention (in the last column of the Table 1) the references linked to each steps with published results of the authors.

Nr. crt.	Evaluation level		Supplied information	Own references
	D.L. Kirkpatrick	J.J. Phillips		
1.	Reaction	Reaction, satisfaction and planned actions	Measures the satisfaction extent of participants in relation to the business educational program and highlights the action plans to implement the business educational program.	Blaga and Gabor, 2014
2.	Learning	Learning and confidence in applicability	Measures the transfer of knowledge and skills within the business educational program, as well as the confidence that these can be applied in daily activity.	Blaga and Gabor, 2018
3.	Behaviour	Application and implementation at work	Measures the participants' changes of behaviour and attitude in daily activity at work.	Blaga and Gabor, 2016
4.	Results	Impact on business results	Measures the change of performance indicators of participants at the business educational program.	Blaga and Gabor, 2016
5.	-	ROI	Measures the ratio between the net benefits of the training program and the total costs generated by it.	Actual

Table 1. Summary of Kirkpatrick's and Phillip's models
Source: Blaga and Gabor, 2014; Blaga and Gabor, 2016; Blaga and Gabor, 2018

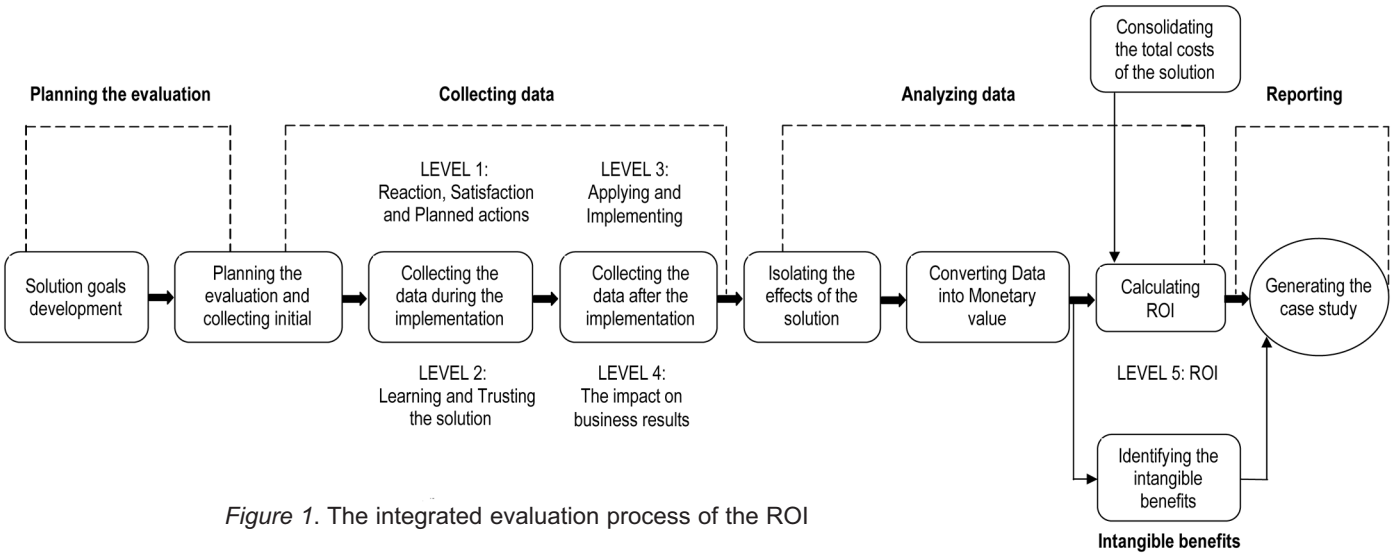


Figure 1. The integrated evaluation process of the ROI

The ROI integrated process (Phillips, 2003) was modified and refined over time and over many applications (Kumpikaite, 2007; Phillips, 2008) (Fig. 1), the process is comprehensive from the perspective that the data are collected at times and from different sources of information, finally obtaining several types of information (Phillips, 2008). The present paper follows all this process (Fig. 1), for the entire research, in the literature review we find another study who follow the Kirkpatrick' four levels approach (Phillips and Phillips, 2008).

The process involves determining the ROI in training indicator (Kumpikaite, 2007), which has become one of the most difficult and interesting problems of professional training of HR faced by the HRM (Khokhar and Jalbani, 2018). However, in time this has faced a strong resistance of the market actors for this type of analysis (Phillips, Phillips and Pulliam, 2014a) even at the top management level (Phillips, Phillips and Pulliam, 2014b), some of this resistance being based on fear and misunderstanding; actual barriers and obstacles (Phillips, Phillips and Pulliam, 2014a) or the lack of training opportunities provided within the organization (Khokhar and Jalbani, 2018). Without evaluation, it is very difficult to show that training was the reason for any improvements (Kumpikaite, 2007).

Actually, most organizations has difficulties when they should decide what training programs they should invest in, how much they should invest in and if a certain initiative in the field of HR will provide added value or not (Blaga and Gabor, 2016). It can be challenging to identify those emerging skill sets, which will likely have lasting effect and will provide strong ROI (Day et al., 2017). The importance of evaluating HR development initiatives within an organization is related to measuring investment profi-

tability in such kind of projects (Blaga and Gabor, 2014; 2016). In Romania there is a single case study completely carried-out at MedLife made in 2008.

3. Materials and Methods

According to data from Table 1, in this research paper we present only the level 5 of Phillips ROI Methodology, in previous published papers of the authors was being presented the results for level 1 (Blaga and Gabor, 2014), level 4 (Blaga and Gabor, 2016), and the results for levels 2 and 3 (Blaga and Gabor, 2018).

For entire research, the data was post-collected (Bele et al., 2015) a month after training program from a sample of 50 employees of a total 200 employees of the organization, respectively personnel from the quality management, research laboratories, production, distribution divided into 2 groups of trainees each, with age between 25 and 60 years (Blaga and Gabor, 2014; 2016; 2018). Data have been gathered by means of questionnaire with 5 point Likert scale and have been processed by means of Excel using descriptive statistics. Also, to collect data from Table 2, the authors discussed with the general manager of the organization (Khokhar and Jalbani, 2018). To calculate the ROI we used classical formulas for cost/benefices (Kroeger et al., 2019) the results present of the study case being presented in the next section. For calculus and data presented in the tables we have maintained the values denominated in Romanian lei due of the fact that for the aim of this research it is important the percents of the final results not the absolute values of them. For calculus presented in Table 3 we used (for columns 0-2) data collected with questionnaire at Level 4 of ROI Methodology (The impact on business results) of Kirkpatrick and Phillips (detailed in Table 1 and Fig. 1) and published by the authors (Blaga and Gabor, 2016). These data representing the answers to the following questions (Blaga and Gabor, 2016):

- How has the organization benefited following your participation in the e-learning training program related to the quality analysis and evaluation methods? (column 1 from Table 3);
- Reflect over specific achievements/improvements specific in the quality assurance activities and think to specific methods where in you can convert these achievements into a monetary value (0-120000 Lei), (column 2 from Table 3);
- How sure of the above estimates? (column 3 from Table 3).

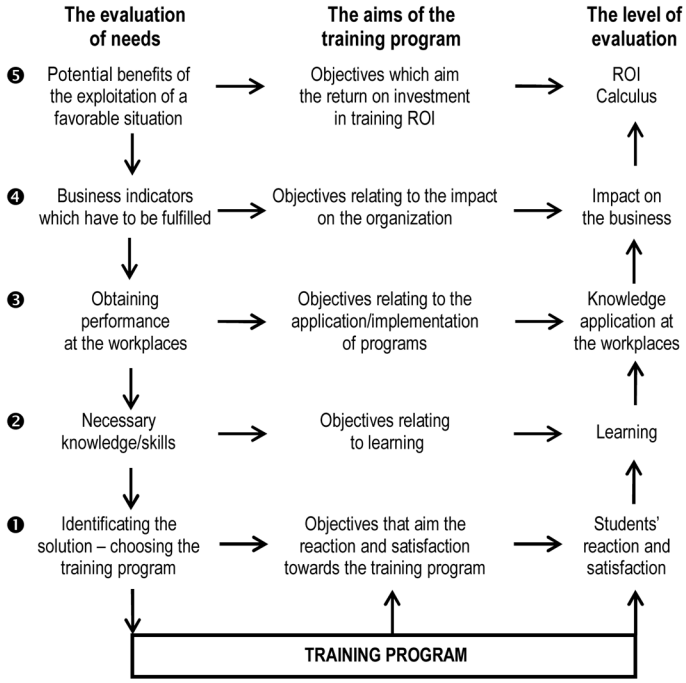


Figure 2. The relationship of need – the evaluation level in the ROI methodology for concordance between the training program and its expected impact on the company organization performances

4. Results

In most cases the analysis needed for planning the evaluation stops at Level 2, neglecting the objectives related to the impact of the training program. Follow the 4th step of Phillips ROI model (Blaga and Gabor, 2016) (Fig. 1 – analysing data and reporting steps and Fig. 2), the participants estimate the percent of training program on each problem assed (columns 0 and 1 of Table 3) and transform data into monetary values (column 2 of Table 3).

Another important step of the ROI is determining the costs involved in the training program. The main cost categories considered in this research are shown in Table 2.

Cost categories	Cost [lei]
1. Initial costs of the program (*serves, software for virtual classroom, hardware*)	29 000
2. Maintenance costs related to e-learning technology (*software annual maintenance entry and software upgrades*)	1 500
3. Development costs of the program *(salary cost, materials and supplies for the training program, creation / graphic for e-learning educational materials, other expenses, testing the educational environment)*	10 500
4. Promotion costs of the program *(Salary costs, Printing presentation brochures, Outsourcing services: television, radio, press, Internal services, Expenses with the software, Expenses with the hardware, Other expenses)*	8 400
5. Costs related to the program *(Salary costs, Costs of developing educational materials for the modules of the training program, Costs related to the tutor, Costs for using e-learning facilities, Hardware costs, Software costs, Other expenses)*	19 000
6. Evaluation costs of the program *(Cost of drafting questionnaires, Costs of printing questionnaires, Costs of evaluating questionnaires, Expenses with the software, Expenses with the hardware, Other expenses)*	6 500
Total costs of the programs	74 900

Table 2. Major differences in technical documentation
Source: Data obtained from the general manager of the organization

Regarding the stage of calculating the return on ROI, this aims to compare the monetary value of the obtained benefits from implementing the training program with the program costs, being possible to determine it in two ways (Phillips, 1998; 2003):

- Benefits/Costs Report (BCR) (Kroeger et al., 2019; Kamal, 2015; Sarkisand Sundarraj, 2001) is determined by reporting the training program benefits to its total costs;
- The ROI is determined based on the net benefits that are divided to the total program costs. Net benefits are obtained from the program benefits minus the total costs.

Another important stage is identifying the intangible benefits, which in addition to the tangible benefits (concrete) measured by monetary values (Kumpikaite, 2007), in the case of the majority of training programs are identified non-cash intangible benefits too, in this research those being structured as shown in Table 3.

To calculate the ROI in training (Baxter et al., 2014), the data collected in level 4 (Blaga and Gabor, 2016) of the evaluation regarding the organizational impact, are converted into monetary values and compared to the costs of the training program through e-learning. This process, is the most used method of evaluation in the world (Phillips, Phillips and Pulliam, 2014a) that guarantees consistency and effectiveness (Phillips, Phillips and

Level 4 The problems assessed	Percentage results	Value results [lei]	Adjustment indices (confidence level)	Benefits [lei]
0	1	2	3	4 = 2 * 3
The number of internal defects	10% decrease	13 000	75%	9 750
The number of external defects	15% decrease	18 750	80%	15 000
Customer complaints	20% decrease	6 500	75%	4875
The increase of the number of new customers	3% increase	17 500	85%	14 875
Increased sales	7% increase	23 500	85%	19 975
Turnover	3% increase	29 500	85%	25 075

Table 3. The e-learning training program benefits according to the Level 4 research results
Source: Own calculations starting from the data collected at Level 4 of the research according to reference (Blaga and Gabor, 2016)

Pulliam, 2014b) being necessary for determining the monetary benefits (O'Donnell, 2015) from implementing the training program through e-learning. ROI is the ratio of money gained or lost on an investment relative to the amount of money invested (Shabestari and Roudsari, 2009). The ROI stands out considering the benefits and costs of the training program through e-learning:

$$ROI = \frac{89550 - 74900}{74900} \times 100[\%] = 0.1956 \times 100 = 19.56\%$$

As a result, the beneficiary company of the training program through e-learning of HR gains 19.56% increase for every 1 Lei invested, obtaining a net benefit of 0.2 Lei for every 1 lei invested.

Many years ago, 80% of the value of a company was to create tangible assets, today, large companies constitute 80% of their values to property rights and high-quality of human resources (Bircan and Gencler, 2015).

5. Discussions

As the result of applying a full 5 steps evaluation process of Phillips, these results highlight some benefits of implementing this process:

1. *The opportunity to highlight the contribution of programs of HR.* Thus, according to the value of ROI, the decision to extend, modify or quit a program dedicated to HR has a real foundation based on figures, enterprises asses their performance mostly based on methods using financial variables and indicators (Krechovska, 2014).
2. *Managers will appreciate a process that shows the added value brought to the organization.* Human capital management represents a modern concept of people management that is based on the business strategy (Kucharcikova, Miciak and Hitka, 2018) of the organizations.
3. In time, applying this process *will convince top management to see training programs for HR as some investment and not as costs.* Mid-level managers will see that the HR training programs contribute to the fulfilment of the goals they have.
4. The measurement and assessment of the effectiveness of the utilization of human capital and effectiveness of investment in its development leads to the increase of performance and competitiveness of the enterprise within the context of *sustainability* (Kucharcikova, Miciak and Hitka, 2018).
5. *Improving the training process* – because more data are collected during the program, their analysis may lead to changes and improvements in the training program. Thus the ROI process becomes a very valuable tool for the development of the quality of HR training programs and HR development is predominantly understood as a tool of management (Poell and der Krogt, 2017).
6. *Organizations which have more developed training activities achieve higher level of productivity and service quality* (Slavic and Berber, 2019).
7. *Developing an approach based on results* – during the construction and implementation of the ROI process the organization focuses on achieving the results. Also, other results indicate that strategic HRM positively influences the relationship of HR and organizational learning capability (Gozalan and Pawlowsky, 2015).
8. *Modification or removal of ineffective programs*. The ROI process will signal the need to modify the training program of HR (because key element of learning in organizations such as training and development, have co-evolved with changes in managerial practice (Sambrook and Willmott, 2014)). Also, in the existing literature it suggests that managers should invest in programs that increase and retain firm-specific sustainable human capital (Crook et al., 2011).

If the company receives an inadequate ROI, will reduce its investment in training or look for training providers outside the company (Kumpikaite, 2007). Even if there are significant progresses in implementing the ROI process, there are some difficulties that hinder its application in many organizations. Moreover, in the specialty literature there are made recommendations regarding the periodical review and improvement of the methodology (Phillips, Phillips andPulliam, 2014a). The most important ones are listed below: costs and time (Kocher, 2017) and/or *lack of skills in HR managers* (Kocher, 2017); *Wrong or incomplete initial analysis* (Garrick and Chan, 2017); *the discipline and planning process* (Dlugos and Samolejova, 2014); *false assumptions*.

To be effective, even the best designed process or model must be integrated into the organization. Often, resistance to the ROI arises (Phillips, Phillips and Pulliam, 2014a) and it can fail if it is not integrated properly (Phillips, Phillips and Pulliam, 2014b). Training evaluation provides the data needed to demonstrate that training does provide benefits to the company (Kumpikaite, 2007), ROI could be used as indicator of the cost-benefit of e-learning training program (Shabestari and Roudsari, 2009). Also it is important to promote the ROI assessment as a set of procedures that process data to provide an effective evaluation of a project (Andru and Botchkarev, 2012).

The increasing interest for ROI was and is influenced by a number of factors. Thus, the pressure of the training recipients and of the managers of the organizations to demonstrate the return on training in investment is probably the most influential element, most of the managers considering training more of as a cost rather than an investment (Babapour, Gholipour and Mehralian, 2018). The international studies (Riley, Michael and Mahoney, 2017) show that managers who view employee human capital as an asset to be invested in and developed can expect to outperform those who view it as a cost to be minimized. Moreover, the economic pressures require an intense control of all the expenses, including the costs of professional training of HR in the organizations. The total quality management and the reengineering determined an increased interest in measurement and evaluation, including measuring the effectiveness of training HR.

The HR training efficiency is generally measured through qualitative indicators and/or studies (Khokhar and Jalbani, 2018) hat do not offer quantifiable information for the management of the organizations. For this reason this research is important

because it establishes the quantitative nature of the results of the HR training programs. The managers of the organizations may dispose of value information that conveys the benefits of the investment obtained from the HR training. Focusing on obtaining results and getting a high ROI indicator ratio provides an addition added value to the activity of the organization based on the high standard of the HR training.

6. Conclusions

The results of our study case emphasizes that the added value resulted from the e-learning could represents a competitive advantage for the organizations (Susanu, Cristache and Micu, 2010) and for sustainable HR. The present results closed the entire five stages/level of Kirkpatrick' and Phillips' models and, (together with the previous published results of the authors) fill a gap in the international literature and offer a new point of view regarding the actuality and necessity of ROI.

The decision to invest in the HR of the organizations, maintaining or increasing budgets allocated to them in the current period will exist within the organizations but the difference from the previous periods and in some organizations, training is not considered as a priority (Babapour, Gholipour and Mehralian, 2018); will be given by the strict choice of programs with immediate and maximum impact on the business of the organizations. In this context, adopting some evaluation methodologies of the benefits generated by the initiatives in the HR will be a solution to the streamline programs of the activity based on a better cost management. Knowledge about the ROI can help to make competent decisions, which would have an economic benefit in the future (Giziene, Simanaviciene and Palekiene, 2012) for the companies.

Our results confirm the international results (Riley, Michael and Mahoney, 2017) that provide robust support for the proposition those effective investments in human capital and training matter, the value of ROI measurements in shaping strategic (Khokhar and Jalbani, 2018) and management decisions (Bellucci et al., 2019) investment in education should give a higher rate of ROI (Giziene, Simanaviciene and Palekiene, 2012). Therefore we consider this aspect for future research that these human capital investments are more impactful when combined with complementary assets of research and development, physical capital, and advertising investments (Riley, Michael and Mahoney, 2017).

Compare with other positive results of ROI (Khan, Pramjeeth and Kader, 2018; Chang and Chen, 2014), i.e. $2.28 (van Katwyk et al., 2019), 2.98 (Aguilar-Agudo et al., 2019), 1.61 (Selviandro, Suryani and Hasibuan, 2015; Selviandro, Suryani and Hasibuan, 2014) our results show that for each monetary unit spent offered a net ROI of 1.19 Lei and in conclusion, ROI can offer information about the increased performance and challenges in the organization by e-learning training program, determining the tangible return obtained with the investment (Aguilar-Agudo et al., 2019). Rate of ROI in human capital is positive even after direct and indirect costs estimation (Giziene, Simanaviciene and Palekiene, 2012). Also, before a management decides to implement an e-learning system they should know the goals which will be met by the system (Kamal, 2015).

The general trend towards the responsibility of all the decision makers in the organizations required to the HR departments to assess their own contribution in achieving the goals of the organizations. All these have created an unprecedented demand for the applications of the ROI evaluation process.

The evaluation of the HR training should be seen as a necessary process that can be made by comparing the results of the training with the set objectives or with the training costs in relation to the resulted benefits. At the international level, for some sectors (i.e. food, chemical and pharmaceutical) new concepts of not only sustainable but green HRM is introducing as well as their impact on the sustainable performance (Zaid, Jaaron and Bon, 2018), respectively: environmental, social and economic performance. Regarding this aspects, some international results prove that when sustainability is valued and promoted by the organization and line managers, employees are more likely to internalize and make sense of sustainability (Pellegrini, Rizzi and Frey, 2018) and also that it exist an important impact of the HR management process to achieve a sustainable competitive advantage in organizations (Alhawari et al., 2018; Chen and Zhu, 2013). Our results also emphasize the benefit of a partnership between universities/any educational institutions and stakeholders.

The ROI methodology can help to demonstrate how HR training programs contribute to the success performance of the organization, while ensuring the development of some strategic analysis and decision making skills.

Consequently, the absence of some coherent organizational HR makes organizations impossible to adapt to the changes of the international environment, while HR activities must be understood in interdependence with all other processes occurred in an organization. In the global era, people and not companies form the adaptive mechanism that determines how organizations respond to environmental challenges (Muscalu and Muntean, 2014). A good HR systems and establishing a flexible organization ways enhance the dynamic capability of enterprises to gain and/or to maintain sustainable competitive advantage (Yan and Gao, 2016). The HRM, as a strategic management process, is much more difficult in comparison to promoting technical progress or lack of financial resources. The organizations that have learnt how to lead their people applying a good HRM went through a phase in addition to others because the ensuring and maintaining of the quality of HR are long-term strategic processes. HR, as one of core competitiveness of enterprises, is of great significance to the existence and development of enterprises (Xing, 2016). These themes have significant implications for the international evaluation strategy policy and practice (Doherty and Dickmann, 2012).

Regarding the limits of this research we mention that it is very important to understand corporate behaviour related to employee training not only from the perspective of a single enterprise (like in the present research) but also from that of multiple enterprises (Zhang et al., 2019). Stating from this limit and for future research we already extend the research on three Romanian pharmaceutical organizations with declared aim to compare two type of training program, respectively e-learning and live (traditional) training (Shabestari and Roudsari, 2009; Geiger et al., 2018). Also, we want to introduce the new concepts of: (a) sustainable return on investment (SROI) (Shanmugam et al., 2019) for Romania, the pharmaceutical sector being a chemical, polutive, industry (Shanmugam et al., 2019) and (b) social return on investment (SROI) the pharmaceutical sector being also direct linked with health sector and therefore indirect linked with the social sector (Aguilar-Agudo et al., 2019; Bellucci et al., 2019; Shanmugam et al., 2019).

Based on these results we can suggest for the Romanian organizations (but not only) to minimize the investment costs of training and to improve the sustainability of human resource management from the employee training perspective (Zhang et al., 2019). Based on these results we can conclude also that in Romania, like in Slovakia for example (Kucharcikova, Miciak and Hitka, 2018), the concept of human capital management have a little use. To assess the effectiveness of investment in education must be a part of the human capital management process (Kucharcikova, Miciak and Hitka, 2018) because human capital is the most valuable asset of an organization that can create a sustainable competitive advantage for organizations (Gharibpoor, Sargazi and Aref, 2013). In conclusion, we can consider that our research results confirm the international results; respectively that e-learning is efficient (Gharibpoor, Sargazi and Aref, 2013), the bottom line in many e-learning projects being the economic feasibility (Kamal, 2015).

References

[1] Aguilar-Agudo, A., Herruzo-Cabrera, J., Ochoa-Sepulveda, J.J. et al. (2019). Social return of investment (SROI) in evidence-based treatments. *Clinica Y Salud*, 30(1), 13-20.
[2] Albulescu, S.C., Dascalu, O. (2013). Actual Human Resources Tendencies in a Multi-Speed Global Economy; *Proceedings of 6th ICMIE 2013*; 281-287; Bucharest, Romania.
[3] Alhawari, S., Al Jarrah, M.A., Karadsheh, L., Naser, M. (2018). The Influence of Human Resources Management Processes (HRMPs) to Achieving Sustainable Competitive Advantage; *Int J KnowlSystSci*; 9(1), 41-58.
[4] Andru, P., Botchkarev, A. (2012). ROI for Technology Projects: Measuring and Delivering Value; *IEEE T Engineering Manage*; 59(4), 766-770.
[5] Arjunan, M.; (1991). Maximizing ROI by minimizing process variability; *Annual Symp on Reliability and Maintainability*; 559-564; Orlando, FL, USA.
[6] Armstrong, M. (2006). *A Handbook of Human Resource Management Practice* (10th Edition), London: Kogan Page Limited.
[7] Babapour, J., Gholipour, A. and Mehralian, G. (2018). Human Resource Management Challenges to Develop Pharmaceutical Industry: Evidence from Developing Countries; *Iran J of Pharm Res*; 17(2), 224-238.
[8] Baxter, S. et al. (2014). The Relationship between Return on Investment and Quality of Study Methodology in Workplace Health Promotion Programs; *Am J Health Promot*; 28(6), 347-363.
[9] Beardwell, J., Claydon, T. (2007). *Human Resources Management. A Contemporary Approach* (5th Edition), Harlow: Pearson Education Limited.
[10] Bele, J.L., Bele, D., Pirnat, R. et al. (2015). Business Intelligence in e-Learning; *Proceedings of 2015 ICICL*; 369-375; IEEE, Firenze, Italy.
[11] Bellucci, M., Nitti, C., Franchi, S., et al. (2019). Accounting for social return on investment (SROI) The costs and benefits of family-centre care by the Ronald McDonald House Charities; *Soc Enterp J*; 15(1), 46-75.
[12] Berredo, R.F., Soeiro, A.V. (2004). A proposal of a methodology for benchmarking learning objects; *Proceedings of EISTA '04*; 3, 117-120; Orlando, FL.
[13] Bircan, I., Gencler, F. (2015). Analysis of Innovation-Based Human Resources for Sustainable Development; *Proceedings of the WCTIE*; 1348-1354; Istanbul, Turkey.
[14] Blaga, P. (2012a). National and European trends in approaching the human resources strategy; *Rev of Manag & Econ Eng*; 11(43), 11-24.
[15] Blaga, P. (2012b). Worldwide trends in approaching company's human resources strategy; *Rev of Manag & Econ Eng*; 11(44), 24-29.
[16] Blaga, P., Gabor, M.R. (2014). Investigating the impact of e-learning as an alternative for business education in pharmaceutical industry in Romania by ROI Methodology; *Amfiteatru Econ*; 16(37), 902-916.
[17] Blaga, P., Gabor, M.R. (2016). Evaluation of the E-Learning Program Impact over Organizations in the Romanian Pharmaceutical Industry; *Indian J Pharm Educ*; 50(4), 517-529.
[18] Blaga, P.; Gabor, M.R. (2018). Contribution of ROI Methodology in Romanian Pharmaceutical Industry through e-learning to improve performance of human resources; *Inz Ekon - Eng Econ*; 29(3), 312-318.
[19] Boardman, A.E., Greenberg, D.H., Vining, A.R., Weimer, D.L. (2004). *Analiza Cost-Beneficiu. Concepte şi practică* (second edition), ARC, Bucharest.
[20] Chang, N., Chen, L. (2014). Evaluating the Learning Effectiveness of an Online Information Literacy Class Based on the Kirkpatrick Framework; *Libri*; 64(3), 211-223.
[21] Chen, G., Zhu, C. (2013). Analysis of the Fit of Enterprises' Strategic Positioning with Human Resources; *Proceedings of the 2nd ICSSE*; 47; 285-289; Hong Kong, China.
[22] Crook, T.R. et al. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance; *J of Applied Psychol*; 96(3), 443-456.
[23] Day, T.E., Parker, S.H., Lederman, V., et al. (2017). Evaluating New Skill Sets for Performance Improvement Human Factors as a Case Study; *Health Care Manager*; 36(2), 123-128.
[24] Dlugos, I., Samolejova, A. (2014). Competencies – the common language of employees in industrial companies; *Proceedings of 23rd ICM&M*; Brno, Czech Republic.
[25] Doherty, N.T., Dickmann, M. (2012). Measuring the return on investment in international assignments: an action research approach; *Intl J of Human Res Manag*; 23(16), 3434-3454.
[26] Feldman, K., Jazouli, T., Sandborn, P.A. (2009). A Methodology for Determining the Return on Investment Associated with Prognostics and Health Management; *ICPHM*; 58(2), 305-316; Denver.
[27] Fonseca, T., de Faria, P. and Lima, F. (2019). Human capital and innovation: the importance of the optimal organizational task structure; *Res Policy*; 48(3), 616-627.
[28] Garrick, J., Chan, A. (2017). Knowledge management and professional experience: the uneasy dynamics between tacit knowledge and performativity in organizations; *J of know manag*; 21(4), 872-884.
[29] Geiger, K.B., LeBlanc, L.A., Hubik, K., et al. (2018). Live training versus e-learning to teach implementation of listener response programs; *J Appl Behav Anal*; 51(2), 220-235.
[30] Gharibpoor, M., Sargazi, S., Aref, M. (2013). Efficiency evaluation of e-learning compared to traditional education in human resource development (Case Study: Small and medium enterprises in Shiraz),*7th Ice-CDC*; Iran.
[31] Giziene, V., Simanaviciene, Z.; Palekiene, O. (2012). Evaluation of Investment in Human Capital Economical Effectiveness; *Inz Ekon - Eng Econ*; 23(2), 106-116.
[32] Gozalan, A.,Pawlowsky, P. (2015). Driving innovativeness through the management of human resources and organizational learning-an empirical investigation; *Proceeding of 10th IFKAD*, Bari, Italia.
[33] Harvey, B., Herbig, T., Keylock, M., et al. (2012). Exploding the Legend of TV Advertising and Price Promotions The Proper Mix of Price, In-Store, and TV for Maximum Short-and Long-Term ROI; *J of Adver Res*; 52(3), 339-345.
[34] Kamal, A.M.M. (2015). E-learning Capital Budgeting Decision Models (A Comparative Analytical Study), *Proceedings of 5th IC on e-Learning*; 231-236; Manama, Bahrain.
[35] Kiesnere, A.L., Baumgartner, R.J. (2019). Sustainability Management in Practice: Organizational Change for Sustainability in Smaller Large-Sized Companies in Austria; *Sustainability*; 11(3), 572.
[36] Khan, R., Pramjeeth, S., Kader, A. (2018). The Impact of Educational Technology on Training and Development in the Banking Sector; *Africa Educ Rev*; 15(1), 85-107.
[37] Khokhar, R.P., Jalbani, A. (2018). Learning Capabilities for Strategic Thinking in Family Businesses; *Proceedings of the 31st IBIMAC*; I-XI; 1524-1549; Milan, Italy.
[38] Kirkpatrick, D.L. (1959a). Techniques for evaluating training programs: Reaction; *Amer Soc for Training & Develop J*; 18; 3-9.
[39] Kirkpatrick, D.L. (1959b). Techniques for evaluating training programs: Learning; *Amer Soc for Training & Develop J*; 18, 21-26.
[40] Kirkpatrick, D.L. (1960a). Techniques for evaluating training programs: Behaviour; *Amer Soc for Training & Develop J*; 19; 13-18.
[41] Kirkpatrick, D.L. (1960b). Techniques for evaluating training programs: Learning; *Amer Soc for Training & Develop J*; 18; 28-32.
[42] Kirkpatrick, D.L. (1994). *Evaluating Training Programs: The Four Levels*; Berrett-Koehler Publishers; San Francisco.
[43] Kirkpatrick, D.L. (1998). *Evaluating training programs: The four levels* (2nd ed.), Berrett-Koehler Publishers; San Francisco.
[44] Kirkpatrick, D.L., Kirkpatrick, J.D. (2005). *Transferring learning to behaviour: Using the four levels to improve performance*; Berrett-Koehler Publishers; San Francisco.

[45] Kirkpatrick, D.L, Kirkpatrick, J.D. (2006). *Evaluating training programs: The four levels* (3rd ed.), Berrett-Koehler Publishers; San Francisco.
[46] Kocher, R.E. (2017). Change in recruitment in the frame of digital transformation; *Proceedings of 29th IBIMAC*; Vienna, Austria.
[47] Krechovska, M. (2014). Business performance management considering intellectual capital; *Proceedings of 6th ICIC*; Bratislava, Slovakia.
[48] Kroeger, T., Klemz, C., Boucher, T., et al. (2019). Returns on investment in watershed conservation: Application of a best practices analytical framework to the Rio Camboriu Water Producer program. Santa Catarina, Brazil; Jarrah. *Sci Total Environ*; 657, 1368-1381.
[49] Kucharcikova, A., Miciak, M. andHitka, M. (2018). Evaluating the Effectiveness of Investment in Human Capital in E-Business Enterprise in the Context of Sustainability; *Sustainability*; 10(9), 3211.
[50] Kumpikaite, V. (2007). Human Resource Training Evaluation; *Inz Ekon - Eng Econ*; 5; 29-36.
[51] Manole, C., Alpopi, C. (2013). Continuous Professional Training and the Situation of Labour Market in Romania; *Proceedings of the 20th IECS*; 6, 296-305; Sibiu, Romania.
[52] McIntosh, C.R. (2013). Information services and return on investment: How to calculate it; *Library & Inf Science Res*; 35(2), 117-126.
[53] Muscalu, E..Muntean, S.N. (2014). Aspects regarding human resources management streamlining within national and international organizations; *21st IECS*; 173-181; Sibiu, Romania.
[54] O'Donnell, M.P. (2015). What is the ROI for Workplace Health Promotion? It Really Does Depend, and That's the Point; *Am J Health Promot*; 29(3), V-VIII.
[55] Palos, S., Pedro, R. (2016). Approaching the Key Factors of Return on Investment in Training E-Learning; *3C Empresa*; 5; 12-31.
[56] Pan, D., Wiersma, G., Williams, L., et al. (2013). More Than a Number: Unexpected Benefits of Return on Investment Analysis; *J of Acad Librarianship*; 39(6), 566-572.
[57] Pellegrini, C., Rizzi, F., Frey, M. (2018). The role of sustainable human resource practices in influencing employee behavior for corporate sustainability; *Bus Strateg Environ*; 27(8), 1221-1232.
[58] Perng, C., Chang, R. (2012). Methodology and Tool Design for Building Return on Investment Models for IT Transformations; *9th IEEE Int Conf on e-Bus Eng*; 177-184; New York, USA.
[59] Phillips, J.J. (1991). *Handbook of training evaluation and measurement methods*. Houston: Gulf Publishing Company.
[60] Phillips, J.J. (1996a). ROI: The search for best practices; *Train & Develop*; 50(2), 42-47.
[61] Phillips, J.J. (1996b). Was it the training?; *Train & Develop*; 50(3), 28-32.
[62] Phillips, J.J. (1996c). How much is the training worth?; *Train & Develop*; 50(4), 20-24.
[63] Phillips, J.J. (1998). The return-on-investment (ROI) process: Issues and trends; *Educ Techy*; 38(4),7-14.
[64] Phillips, J.J. (2003). *Return on Investment in Training and Performance Improvement Programs* (2nd Edition), Burlington: Elsevier Science Butterworth-Heinemann.
[65] Phillips, J.J. (2008). *The ROI Field Book: Strategies for Implementing ROI in HR and Training*; Burlington: Elsevier.
[66] Phillips, P.P., Phillips, J.J., Stone, D.R., Burkett, H. (2007). *The ROI Fieldbook: Strategies for Implementing ROI in HR and Training*; Burlington: Elsevier Inc. Butterworth-Heinemann.
[67] Phillips, P.P., Phillips, J.J. (2010). *Return on investment. Handbook of Improving Performance in the Workplace*. Vol. 2, *Selecting and implementing Performance Interventions*; San Francisco: John Wiley and Sons.
[68] Phillips, J.J., Phillips, P., Pulliam, A. (2014a). *The ROI Methodology: A Tool to Measure and Improve*. Scrivener Publishing LLC, Beverly, MA USA, pp. 73-101.
[69] Phillips, J.J., Phillips, P., Pulliam, A. (2014b). *Implementing and Sustaining ROI*. Scrivener Publishing LLC, *Measuring ROI in environment, health, and safety*, Beverly, MA USA, pp. 271-290.
[70] Poell, R.F., der Krogt, F. (2017). Why is organizing human resource development so problematic? Perspectives from the learning-network theory (Part I), *Learning Organization*; 24(3), 180-193.
[71] Rentroia-Bonito, M.A., Goncalves, D. andJorge, J.A. (2015). Clustering Students Based on Motivation to Learn: A Blended Learning Approach; *Int J Mob Blended Learn*; 7(3), 18-39.
[72] Riley, S.M., Michael, S.C. and Mahoney, J.T. (2017). Human capital matters: market valuation of firm investments in training and the role of complementary assets; *Strateg Manage J*; 38(9), 1895-1914.
[73] Sambrook, S., Willmott, H. (2014). The rigor of management education and relevance of human resource development: natural partners or uneasy bedfellows in management practice?; *Manag learning*; 45(1), 39-56.
[74] Sarkis, J., Sundarraj, R.P. (2001). A decision model for strategic evaluation of enterprise information technologies; *Inform Syst Manage*; 18(3), 62-72.
[75] Selviandro, N., Suryani, M., Hasibuan, Z.A. (2014). Open Learning Optimization Based on Cloud Technology: Case Study Implementation in Personalization E-learning; *Proceedings of 16th IICACT*; 541-546; South Korea.
[76] Selviandro, N., Suryani, M., Hasibuan, Z.A. (2015). Enhancing the Implementation of Cloud-Based Open Learning with E-Learning Personalization; *Proceedings of 17th IEEE ICACT*; Pyeonh Chang, South Africa.
[77] Shabestari, O.,Roudsari, A. (2009). Potential Return on Investment (ROI) on web-based Diabetes Education in UK; *Proceedings of CRHCIAITCH*; 143, 258-263; Canada.
[78] Shanmugam, K., Gadhamshetty, V., Yadav, P., et al. (2019). Advanced High-Strength Steel and Carbon Fiber Reinforced Polymer Composite Body in White for Passenger Cars: Environmental Performance and Sustainable Return on Investment under Different Propulsion Models; *ACS Sustain ChemEng*; 7(5), 4951-4963.
[79] Sharma, S., Garg, S. (2016). Literature review on Web based training in workplace, 2010-2015; *The Horizon*; 24(2), 166-174.
[80] Slavic, A., Berber, N. (2019). The Role of Training Practice in Improving Organizational Performance in Selected Countries of the Danube Region; *Inz Ekon - Eng Econ*; 30(1), 81-93.
[81] Susanu, I.O., Cristache, N., Micu, A. (2010). E-learning, a support IT service for the development of university education; *6th QMHE*; 2; 653-656; Romania.
[82] Vaileanu, C. (2017). Analyzing the Social Value of Bucharest Community Foundation Programs: Social Return on Investment; *Found Rev*; 9(3), 46-54.
[83] van Katwyk, S., Thavorn, K., Coyle D., et al. (2019). The return of investment of hospital-based surgical quality improvement programs in reducing surgical site infection at a Canadian tertiary-care hospital; *Infect Cont Hosp Ep*; 40(2), 125-132.
[84] Velciu, M.M. (2014). Competency Development for Supporting Organizations' Competitiveness; *Proceedings of 7th ICERI*; 5543-5548; Seville, Spain.
[85] Xing, X. (2016). Enterprise Human Resources Management Innovative Thinking in the Age of the Internet; *3rd ICMETSS*; 25; 367-370; China.
[86] Yan, G.,Gao, E. (2016). Dynamic Capabilities Enhancing Path: a Perspective on Human Resource Policy; *6th ICMEIC*; 135; 937-940; China.
[87] Yi, L.Y., Zuo, M.Z., Wang, Z.X. (2007). A model for analyzing and evaluating the return on investment in e-learning; *Proceedings of 7th IEEE ICALT*, 79-81; Japan.
[88] Zaid, A.A., Jaaron, A.A.M., Bon, A.T. (2018). The impact of green human resource management and green supply chain management practices on sustainable performance: An empirical study; *J Clean Prod*; 204, 965-979.
[89] Zhang, L., Guo, X., Lei, Z., et al. (2019). Social Network Analysis of Sustainable Human Resource Management from the Employee Training's Perspective; *Sustainability*; 11(2), 380.

Enhance SMEs Performance through Implementing Quality Strategic Leadership, Trust in Leader, Strategic Planning

Arnis Budi SUSANTO[1*], Purnamie TITISARI[2], Ema Desia PRAJITIASARI[3]

[1]Faculty of Economics and Business, University of Jember, Indonesia; E-mail: arnis.feb@unej.ac.id
[2]Faculty of Economics and Business, University of Jember, Indonesia; E-mail: purnamie@unej.ac.id
[3]Faculty of Economics and Business, University of Jember, Indonesia; E-mail: ema.desia@unej.ac.id
[*]Corresponding author

Abstract

This study aims to find out how Quality strategic leadership is key in creating trust in leaders, formulating strategies and improving SME performance in Indonesia. The sample used in this research is SMEs in the East Java region, Indonesia totaling 246 SMEs with various sectors. The results showed that strategic leadership had an influence on how SMEs formulated their strategies. Strategic leadership, if considered, will form a strategic plan in accordance with the character of their SMEs and that strategic plan will improve SMEs performance and competitiveness. Strategic leadership is also able to create trust in leaders that have an impact on improving the performance of SMEs. A Quality strategic leader is also able to improve performance directly. The actions taken by management in SMEs are able to manage conditions in the SMEs where management's role in problem solving, relations between workers will also have an impact on SMEs performance. Based on the limitations of the study, we recommend conducting research on SMEs with a homogeneous SMEs sector to obtain more specific analytical results in accordance with the existing SMEs sector.

Keywords: *quality strategic leadership; strategic planning; trust in leader.*

1. Introduction

SMEs is one of the important sectors for economic growth in various countries (Storey, 2016). Culkin & Smith, (2000) emphasized that SMEs which have a maximum of 200 employees constitute the largest business sector in the world economy and the government paid special attention to SMEs by issuing several regulations that supportSME growth in their country's national strategy (Abdullah & Bakar, 2000) .

Strategic issues in developing SME include several things, namely, the availability of quality natural resources, competitive and competitive; the availability of creative human resources, competitive, growing and diverse SMEs, the availability of financial funding, expansion of market share, availability of competitive infrastructure and technology, and institutions that support SMEs (Research & Education, 2017).

SMEs in Indonesia have considerable potential. To optimize MSME still requires efforts so that SMEs products and management can become Go Glocal. A special study is needed on how to manage SME in various sectors in order to improve SME competitiveness.

In any organization, an understanding of strategic leadership has an important role which will make it easier for management to direct their organizations to a better direction (Özer & Tınaztepe, 2014). Voelpel, Leibold, & Eckhoff (2006) emphasize strategic leadership as the ability of leaders to predict, manage flexibility and empower employees to create the strategies needed. Good organizational leaders are able to identify and be more flexible. Some leadership elements that describe the scope of leadership include; complexity, time span, and focus (Guillot, 2003). Strategic leadership at SME has its own uniqueness because it has different characteristics from other organizations. UMKM performance is one of the things that is challenging and requires the art of how leaders see potential strategies and will encourage ways of thinking to bring better performance (McCleskey, 2014). This is in line with research conducted by (Titisari, Susanto, & Prajitiasari, 2018) which in his research shows that the strategic role of leadership will have an impact on SMEs performance.

Besides that strategic leadership also has an important role for employees. With a good strategic leadership will empower employees to form attitudes and work personality. This personality is the organizational citizen behavior (OCB) that reflects cooperative employees. While the basic attitude will indicate that employees involved in organizational citizen behavior respond to the organization's actions. This form of OCB emerges through trust in leaders (Titisari, 2014). With the trust in leader, employees will have a commitment to the goals of the organization (Hitt, Keats, & Yucel, 2003).

SMEs generally have a traditional managerial pattern that often ignores how leadership roles. The management pattern of SME in Indonesia is more influenced by the prevailing cultural system. This study tries to examine how quality strategic leadership creates trust in leaders, strategic planning, and examines its effect on the performance of SMEs in the East Java region, Indonesia.

2. Literature

2.1. Quality Strategic Leadership

Leadership plays an important role in the success or failure of an organization. The relationship between leadership and performance has been widely discussed. Based on (Kerr,

Schriesheim, Murphy, & Stogdill, 1974), good leadership will be able to produce commitment and job satisfaction that have an impact on improving organizational performance.

Quality Strategic leadership plays an important role in improving SME performance. Strategic leadership will provide a good understanding for management to manage their resources and maximize them to improve the performance of SMEs (Titisari et al., 2018) with the quality strategic leadership, employees in the organization will be able to work in accordance with organizational goals more optimally.

2.2. Trust in Leader

Various literature describes the trust in leader will strengthen how the relationship between employees and leaders. With the belief in the leadership, employees will be more loyal to the organization and have an impact on organizational citizen behavior behavior (Podsakoff & MacKenzie, 1997). Trust in leader is a relationship between two or more parties between the leader and the abbahan involving voluntary acceptance of the risk of hope that the person who is trusted will make an action that has a positive impact on those who trust. (Abid, Gulzar, & Hussain, 2015)

Titisari (2014) in her research also revealed how trust in leaders is seen as an important key in organizations. Trust in leadership is seen as a forming factor in Organizational citizen Behavior that has a positive impact on the performance of an organization.

2.3. Strategic Planning

The organization needs a strategy to achieve the goals that have been set before and continued with the determination of the strategic plan in the form of activities and allocation of resources needed to achieve these goals (Susanto, 2017)

Organizational strategy is an important stage that must be owned by every organization. Without a broad understanding and description of strategy, management cannot communicate a clear strategy to employees (Susanto, 2017). The development of the concept of strategic planning has a fairly rapid development. Pearce, Robinson, & Subramanian (2000) stated the importance of strategic planning for organizations in improving organizational performance. The strategy focuses on whether the organization is able to survive in both the long and short term.

Strategy must be implemented effectively; therefore strategic planning must combine the right decisions with organizational goals. The right decision in question is how the leadership's role in seeing opportunities and threats from both the external and internal environment of the organization. Strategic planning that is compiled must be flexible, comprehensive and integrated with environmental challenges designed to achieve organizational goals (Susanto, 2016).

2.4. Quality Performance of SMEs

Performance is a measurement of the achievements or success of a company or organization that is measured during a certain period (Hafeez, Shariff, & Lazim, 2012). There are two points of view in measuring performance, namely the objective approach and the subjective approach (Chandler & Hanks, 1994). The subjective approach is an approach that measures performance based on managers' perceptions of company performance, while the objective approach is an approach that measures performance based on financial data.

Various studies have discussed a lot about performance measurement in SMEs. Measurements that are often used to measure the performance of SMEs are judged by financial performance (Covin & Slevin, 1989). Performance appraisal is seen through the level of sales, sales growth, revenue and overall performance. In addition to the financial aspects, the performance of SMEs can also be measured through other aspects, namely customer satisfaction and productivity levels (Titisari, Susanto, & Prajitiasari, 2018). This study emphasizes the combination of financial performance and aspects of consumer satisfaction as a reflection of the performance of SMEs.

3. Research Model

Based on the paradigm previously discussed regarding the interrelationships between variables, it can then be developed in the following research model:

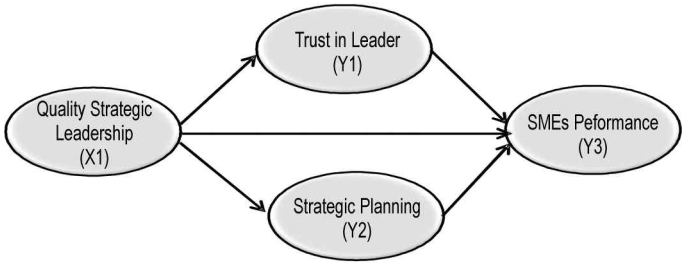


Figure 1. Research Model

Based on the research model, the research equation can be arranged namely $Y3 = \alpha0 + \alpha1Y1 + \alpha2Y2 + \alpha3X1 + \varepsilon$, where "X" is an exogenous variable, "Y1" is an Intervening variable, "Y2" is an intervening variable, and "Y3" is an endogenous variable. Based on phenomena, theories and concepts in the conceptual framework, hypotheses can be arranged as follows: (H1) Quality Strategic Leadership Influences trust in leaders, (H2) Strategic leadership Influences Strategic Planning, (H3) Strategic Leadership influences SMEs Performance, (H4) Trust in Leaders influences the performance of SMEs, (H5) Strategic Planning influences the performance of SMEs.

4. Research Methodology

4.1. Research Design

This research is a quantitative study that aims to find out how the role and influence of Quality strategic leadership in creating trust in leaders, strategic planning, and SME performance in Indonesia with a focus on the area of East Java.

Variable Quality Strategic Leadership uses 3 dimensions of measurement (Hitt et al., 2003) namely (a) Vision; (b) Organizational Culture; (c) balanced control. From 3 dimensions, then arranged into 10 questions (SL1-SL10). The variable Trust in leadership is measured through 4 dimensions used by Bakiev (2013), namely (a) Integrity; (b) Competence; (c) consistency; (d) Loyalty. From the 4 dimensions then arranged into 12 questions in the questionnaire (TL01-TKL12) Strategic planning variables are measured using 4 dimensions of measurement (Pearce et al., 2000) namely (a) Formulation Stage; (b) Implementation Phase; (c) Control stage. The dimensions of strategic planning are then organized into 12 questions in the questionnaire (SP01-SP12). Whereas endogenous variables of SMEs performance are measured through 3 dimensions (Titisari et al., 2018), namely (1) Sales Level; (2) customer satisfaction; (3) level of productivity. From the 3 dimensions of measurement, the SMEs performance variable is organized into 12 questions in the questionnaire (P01-P12).

The questionnaire was compiled and designed using a Likert scale. Testing the research instrument is done by testing the validity, reliability and then testing the structural equation model, including confirmatory factor analysis (McDonald & Ho, 2002).

4.2. Population and Sample Design

Existing data were collected by survey method to test the research hypothesis. Preliminary research was conducted to

test the questionnaire given to SMEs. Data was collected in a period of 4 months starting in July 2018 until November 2018. The sample used in this study amounted to 300 SMEs samples with those engaged in various sectors. All participants are SMEs members where each SMEs is represented by one participant. The questionnaire was given to these participants by involving research assistants and the participants had at least 7 days to return the questionnaire. Of the 300 questionnaires distributed, only 246 returned on time and were used in this study. All questionnaires are entirely voluntary and their credentials are kept confidential for research purposes.

4.3. Data Analysis

The collected data were analyzed using structural equation models with the Amos program. Analysis of structural equation models is used to explore and find out how strategic leadership can improve, strategic planning, trust in leader, and organizational performance

4.4. Analysis and Result

In this section, we will discuss a series of test results such as testing the validity, reliability and analysis of the results using structural equation model.

Based on table 1, it can be explained that all research variables have good reliability.

In this study, the hypothesis developed will be tested by statistical testing to provide answers to the research hypothesis that was developed, based on the results of the test, can be seen in table 2.

Variable		Alpha Cronbach	Ket
Exogenous	Quality Strategic Leadership (X1)	0.826	Reliable
Endogenous	Trust In Leadership (Y1)	0.805	Reliable
	Strategic Planning (Y2)	0.882	Reliable
	SMEs Performance (Y3)	0.811	Reliable

Tabel 1. Result of Reliability Testing
Source: data processed, 2019

Hypothesis	Independent Variable	Dependent Variable	Value	C.R	*P-Value*	Description
1	Strategic Leadership	Trust in Leader	0.211	2.415	0.023	accepted
2	Strategic Leadership	Strategic Planning	0.233	2.345	0.025	accepted
3	Strategic Leadership	SMEs Performance	0.189	2.981	0.013	accepted
4	Trust in Leader	Competitive SMEs Performance	0.184	2.342	0.045	accepted
5	Strategic Planning	SMEs Performance	0.084	2.234	0.043	accepted

Table 2. Hypothesis testing
Source: data processed, 2019-08-16

In this study, the relationship of influence between variables can be seen in Table 2 showing the effect between the independent variable and the dependent variable. The results of this analysis indicate that Strategic leadership has an influence on trust in leaders ($p < 0.05$). These results indicate that the first hypothesis of the study was accepted. The second hypothesis testing shows that strategic leadership influences strategic planning ($p < 0.05$) so that the second hypothesis is accepted. The strategic leadership variable influencing SME performance was also accepted ($p < 0.05$), so the third hypothesis was accepted. The trust in leader variable influences SMEs performance ($p < 0.05$), and the fourth hypothesis is accepted. Then, the strategic planning variable has a positive effect on SME performance ($p < 0.05$) so that the fifth hypothesis is accepted.

5. Conclusions

The practices of strategic leadership, trust in leaders, strategic planning and SME performance have been discussed in this study. Strategic leadership includes how SME leaders are able to develop a vision, organizational culture, and balanced control in their business that will be able to increase employee confidence in the leadership that will have an impact on improving employee performance. The strategic leadership capabilities of the leader are also needed in developing strategic planning. The ability to compile strategic planning also requires a special skill in which the leader is expected to be able to have a clear view of the direction of the business being carried out and be able to control the problems and potential to improve the performance of the SME. This study also includes the body of knowledge from research conducted by Barney and Arikan (2001), which explained that the most important task of a leader is managing the company's portfolio from all aspects such as human resources, culture, financial and social capital, so that it is able creating effective leadership strategies to improve organizational performance.

This research was conducted with heterogeneity of the sample and limited scope of the study area. Participants in our study are SMEs from various sectors which could be biased in one sector of SME where each SME has its own character.

Based on the limitations of the study, we recommend conducting research based on the existing SME clusters or sectors so as to be able to provide an appropriate strategy for each of the existing SMEs clusters.

References

[1] Abdullah, M. A. H., & Bakar, M. I. H. (2000). *Small and Medium Enterprises in Asian Pacific Countries: Development prospects* (Vol. 3). Nova Publishers.

[2] Abid, H. R., Gulzar, A., & Hussain, W. (2015). The impact of servant leadership on organizational citizenship behaviors with the mediating role of trust and moderating role of group cohesiveness; A Study of public Sector of Pakistan. *International Journal of Academic Research in Business and Social Sciences*, 5(3), 234.

[3] Bakiev, E. (2013). The influence of interpersonal trust and organizational commitment on perceived organizational performance. *Journal of Applied Economics and Business Research*, 3(3), 166-180.

[4] Barney, J. B., & Arikan, A. M. (2001). The resource-based view: Origins and implications. *Handbook of Strategic Management*, 124-188.

[5] Chandler, G. N., & Hanks, S. H. (1994). Market attractiveness, resource-based capabilities, venture strategies, and venture performance. *Journal of Business Venturing*, 9(4), 331-349.

[6] Covin, J. Gjsi., & Slevin, D. P. (1989). Empirical relationship among strategic posture environmental context variables, and new venture performance. *Frontiers Entrepreneurship Research*, 16(5), 124-133.

[7] Culkin, N., & Smith, D. (2000). An emotional business: a guide to understanding the motivations of small business decision takers. *Qualitative Market Research: An International Journal*, 3(3), 145-157.

[8] Guillot, M. W. (2003). Strategic leadership: Defining the challenge. *Air & Space Power Journal*, 17(4), 67-77.

[9] Hafeez, M. H., Shariff, M. N. M., & Lazim, H. B. M. (2012). Relationship between entrepreneurial orientation, firm resources, SME branding and firm's performance: Is innovation the missing link. *American Journal of Industrial and Business Management*, 2(4), 153-159.

[10] Hitt, M. A., Keats, B. W., & Yucel, E. (2003). Strategic leadership in global business organizations: Building trust and social capital. In

Advances in global leadership (pp. 9-35). Emerald Group Publishing Limited.
[11] Kerr, S., Schriesheim, C. A., Murphy, C. J., & Stogdill, R. M. (1974). Toward a contingency theory of leadership based upon the consideration and initiating structure literature. *Organizational Behavior and Human Performance*, 12(1), 62-82.
[12] McCleskey, J. A. (2014). Situational, transformational, and transactional leadership and leadership development. *Journal of Business Studies Quarterly*, 5(4), 117.
[13] McDonald, R. P., & Ho, M.-H. R. (2002). Principles and practice in reporting structural equation analyses. Psychological Methods, 7(1), 64.
[14] Özer, F., & Tınaztepe, C. (2014). Effect of strategic leadership styles on firm performance: A study in a Turkish SME. *Procedia-Social and Behavioral Sciences*, 150, 778-784.
[15] Pearce, J. A., Robinson, R. B., & Subramanian, R. (2000). *Strategic management: Formulation, implementation, and control*. Irwin/McGraw-Hill Columbus, OH.
[16] Podsakoff, P. M., & MacKenzie, S. B. (1997). Impact of organizational citizenship behavior on organizational performance: A review and suggestion for future research. *Human Performance*, 10(2), 133-151.
[17] Riset, D., & Edukasi, P. E. K. D. R. (2017). *Data Statistik Dan Hasil Survei Ekonomi Kreatif Kerjasama Badan Ekonomi Kreatif Dan Badan Pusat Statistik*. BEKRAF.
[18] Storey, D. J. (2016). *Understanding the small business sector*. Routledge.
[19] Susanto, A. B. (2016). Model of Private Higher Education Competitive Advantage Strategy. *Proceeding of 39th International Business Research Conference*, 1(2), 143-155.
[20] Susanto, A. B. (2017). *Strategi penciptaan Nilai Organisasi* (1st ed.). Malang: dreamlitera.
[21] Titisari, P. (2014). *The Role of Organizational Citizenship Behaviour (OCB) in Improving Employee Performance*. Jakarta: Mitra Wacana Media.
[22] Titisari, P., Susanto, A. B., & Prajitiasari, E. D. (2018). Performance through Innovation: An Analysis of Small and Medium-Sized Enterprises in Developing Country. *International Journal of Business and Management Science*, 8(3), 615-629.
[23] Voelpel, S. C., Leibold, M., & Eckhoff, R. A. (2006). The tyranny of the Balanced Scorecard in the innovation economy. *Journal of Intellectual Capital*, 7(1), 43-60.

Development of Patronage Ambidexterity and the Performance of Joint Venture Shopping Centers in Indonesia

Bambang Dwi SUSENO[1*], Furtasan Ali YUSUF[2], Denny KURNIA[3]

[1]Associate Professor, Management Department of Faculty Graduated of Bina Bangsa University, Indonesia
[2]Associate Professor of Master Management, Management Department of Faculty Graduated of Bina Bangsa University, Indonesia
[3]Assistant Professor of Economics and Business Faculty of Serang Raya University, Indonesia
[*]Corresponding author; E-mail: proexchellence@gmail.com

Abstract

The study objective was to test the novelty of the development of patronage ambidexterity to describe the contradictions found in previous studies and this study was designed to provide managerial advantages by providing other solution in order to handle the decline found in the performance of joint venture shopping centers in Indonesia. The study populations were the managers of 4 Japanese-Indonesian joint venture shopping centers operated in Jakarta, Bekasi, Tangerang, and Bogor and 3 China-Indonesia joint venture shopping centers operated in Jakarta, Tangerang and Surabaya. Furthermore, this study also observed 2 Singapore-Indonesia joint venture shopping centers operated in Jakarta and South Tangerang. Purposive sampling technique was used to collect the samples. The study instrument used questionnaires which were distributed to the samples that were considered to have the most significant role in the management as well as the services performed in the shopping center. The researchers distributed 275 questionnaires and as many as 218 managers completed the questionnaires. 180 questionnaires were qualified to be used in further stage of the study. Structural Equation Model (SEM) was used to test the data and hypotheses by using IBM AMOS version 22.0 software. The results of whole tests revealed that of the 5 correlations, there were 4 significant correlations at the level of significance previously set. Meanwhile, 1 correlation namely the correlation between the creation of shopping value and managerial performance did not show a significant influence. The novelty presented in this study was the development of patronage ambidexterity which had been evidenced to be able to uncover the effect of the creation of shopping value on the performance of shopping center. Furthermore, the development of patronage ambidexterity was also evidenced to have a significant effect on shopping atmosphere, and this in turn significantly had an effect on the performance of shopping center.

Keywords: *development of patronage ambidexterity; creation of shopping value; shopping atmosphere; performance of shopping center.*

1. Introduction

Shopping center had been introduced to Indonesian people since 1962. The initial introduction was through the establishment of "Sarinah" which was given a name by the independence proclaimed as well as the first president of the Republic of Indonesia, Sukarno in 1962 (https://www.sarinah.co.id/id/company-profile/company-history). Along with the increase in public needs, the retail actors then tried to manage it through the establishment of new shopping centers and the number continues to increase. According to the AISCM/Association of Indonesian Shopping Center Management (2017), 240 shopping centers were spread in major cities and 173 were located in the capital city of Jakarta and the neighborhood cities.

Given that so many shopping centers spread all over regions in Indonesia, the researchers interested in conducting further observation regarding the shopping centers in joint venture between the companies from Indonesia and from other countries. The companies consisted of (1) PT Bumi Serpong Damai Tbk (BSD) in joint venture with Japanese company of Mitsubishi Corporation, (2) Sinar Mas Land Group in joint venture with AEON Group Japan, (3) Lippo Group in joint venture with Mitsubishi Corporation, Japan, (4) PT Alam Sutera Realty Tbk (ASRI) in joint venture with China Fortune Land Development Co. Ltd., (5) Murray Prince which owned 30% shares in joint venture with PT. Graha Indah Semesta, and (6) PT Intiland Development Tbk in joint venture with GIC, a Singapore-owned foreign investment fund company.

Momentous development of information technology urged the establishment of many kinds of online applications created to facilitate the consumers to easily perform online shopping without a need to go to the shopping centers. And this has caused huge decline in the shopping centers performance. Data at the Indonesian Retailers Association/Aprindo (2017) stated that several giant retails in Indonesia such as Matahari, Ramayana, Lotus, and Debenhams Department Store have terminated the operations of their outlets at a number of shopping centers. This condition indicated that shopping center cannot be the main site since it is not able to attract visitors who like to carry out several shopping activities at the same time. Such fact has caused a decrease in the rental rate of shopping centers. The phenomenon of drastic decrease in the performance of shopping centers has encouraged the researchers to conduct an observation.

The evidences found in the previous studies on the performance of the shopping centers still left a gap when it was

correlated to effect of the creation of shopping values obtained by consumers. Researchers who studied whether the shopping value might have an effect on the performance of shopping centers such as Teller, et al., (2008) and Gupta (2015) revealed that the evaluative, qualitative, quantitative, subjective and objective criteria of the consumers' shopping experience had a significant effect on the performance of shopping centers. Other studies which supported this statement proposed that customers were interested in shopping at shopping centers due to the atmospheric stimulation and perceived values (Ho et al., 1998; Steen, 2016).

However, a number of other researchers proposed contradictive findings such as Babin and Babin (2001), Boado (2009), Sadeghi and Bijandi (2011) who stated that the creation of shopping value was not evidence to have an effect on the performance of shopping center.

The background described above showed that there was a decline in the performance of joint venture shopping centers in Indonesia. There was also contrary finding regarding the creation of shopping value and the performance of shopping center. Therefore, this study aims to find the explanations through new concepts to provide managerial advantages by providing other solution in order to handle the decline found in the performance of joint venture shopping centers in Indonesia.

2. Theoretical Framework

According to Turner and Maylor (2013), ambidexterity used in an organization environment is the organization ability to explore and exploit the support of technology and market leadership that focuses on efficiency, control, flexibility and gradual appreciation toward organizational members winning business competition. A study conducted by Birkinshaw and Gibson (2004) applied the test on ambidexterity concept to examine the correlation between ambidexterity and performance by conducting a survey on two individual groups of middle-level managers regarding alignment and adaptability of the company. The results revealed that ambidexterity in an organizational perspective had a significant effect on the performance (O Reilly III and Tushman, 2013, Nosella and Filippini, 2012). Moreover, Wulf et. al., (2010) proposed a supportive argument by pointing out a finding. They claimed ambidexterity as a very strong predictor with more accurate outcomes in assessing organizational performance compared to instruments from traditional strategic management.

The term Patronage is arranged from the word patronous (Latin) referred to as the provision of encouragement, support as well as financial assistance from organization to individual or from individual to other party (Mershman, 2016 and Hillinan, 2014). On the other side, the concept of patronage in different perspective is derived based on the finding of a study conducted by Hsu et al. (2013) who focused on environment support and the existence of patrons as the model of replication.

The idea of development is adopted from sustainable development theory. When sustainable development meets the prerequisites of present needs, then the next generations may be provided with a solution to be able to meet their needs independently (Manns, 2010 and Vob, et al., 2006). However, there was a recommendation previously emerged on how to change the paradigm of integrating organizations and humans with the aspects of ecology and social to improve epistemology defects while modifying the techno-centric paradigm and conventional organizational science (Kemp et al., 2005 and Gladwin et al., 1995).

Based on the theoretical basis described above, the novelty of the current study on the Development of Patronage Ambidexterity was proposed as the development of empathy, support, dexterity, exemplary, ingenuity, and future orientation. Development of Patronage Ambidexterity is in potential position to strengthen the performance of joint venture shopping centers in Indonesia.

3. Development of Hypotheses and Empirical Model

3.1. Correlation between the Creation of Shopping Value and the Performance of Shopping Center

In the previous study, Chebat, et al., (2014) conducted an in depth assessment on the correlation between the creation of shopping value and the performance of shopping centers through exploration of the holistic perceptions of buyers who were significant for the performance of shopping center. Furthermore, a study conducted by Gupta (2015) also highlighted a finding that the performance of shopping center was influenced by shopping experience value obtained by consumers. Other study also supported this opinion and stated that the interest of customers to shop at shopping centers was due to atmospheric stimulation and perceived value (Ho et al., 1998: Steen, 2016). Although there was a contradictive finding, several other researchers still doubted the positive correlation between the creation of shopping value and the performance of shopping center (Boado, 2009; Sadeghi and Bijandi, 2011; Babin and Babin, 2001). Based on the explanation above, the following hypothesis can be proposed:

H1: The stronger the creation of shopping value, the higher the performance of shopping center.

3.2. Correlation between the Creation of Shopping Value and the Development of Patronage Ambidexterity

Based on Dhir, et al., (2018), the outcome of analysis on the ambidexterity derived from the evidence on shopping value made by e-commerce actors in India, ambidexterity was stated to be able to influence the shopping center ability to create shopping value. Therefore, it was a crucial factor to encourage the increase in shopping value so as to drive the development of ambidexterity through customer service by exploiting short and long term innovations on an ongoing basis (Bandera-de-Mello, et al., 2016, Koryak et al., 2018).

Other researchers also presented evidence that the creation of shopping value had an effect on shopping centers managers to provide win-win solution for customers and producers when they implemented various scenarios for future development (Bonnin and Goudeyhe, 2012; Shankar et al., 2011). Based on the explanation above, the following hypothesis can be proposed:

H2: The stronger the shopping value creation, the higher the development of patronage ambidexterity

3.3. Correlation between the Development of Patronage Ambidexterity and the Performance of Shopping Center

Publications presented by Arnold et al., (2011), Sanal et al., (2013) and Rousseau and Venter (2014) explained the findings of their studies that there was a changeless effect of ambidexterity on the performance of shopping center in getting and retaining customers.

In light of the performance of shopping centers, the perspective of shopping patronage showed a strong and significant effect. It further encouraged the patronage development so that decisions on the utilization of resource configurations showed an effect on long-term performance (Anic and Vouk, 2015, Rahman, et al., 2016 and Sohail, 2013). Based on the explanation above, the following hypothesis can be proposed:

H3: The faster the development of patronage ambidexterity, the higher performance of shopping center

3.4. Correlation between the Development of Patronage Ambidexterity and Shopping Atmosphere

A study finding on dexterity in developing a variety of innovations in the retail sector was evidenced to contribute to

the shopping atmosphere and experience. It was an interesting evidence (Armor, 2015; Mohelska and Sokolova, 2018; Pantano and Laria, 2012). Results from other studies also stated that patronage ambidexterity would create such an atmosphere for consumers and it had an effect on shopping motives (Ajayi et al., 2017; Ertekin et al., 2014; Luotola and Reile, 2017; Suseno & Dwiatmadja, 2016).

Within the organizational context, Jansen et al., (2008) and Rosing et al., (2011) mentioned that the increasing ambidexterity as shown in various studies would be a patron among employees which had an effect on the current and future competitive advantage of the organization. Based on the explanation above, the following hypothesis can be proposed:

H4: The higher the development of patronage ambidexterity, the higher the shopping atmosphere

3.5. Correlation between Shopping Atmosphere and the Performance of Shopping Center

The shopping atmosphere had an effect on the increase in consumers' motive to visit the shopping centers due to various motivational factors such as social relations, aesthetics, exploration, diversion and comfort which had been shown to had an effect on overall performance (Chithralega, 2013; Noh et al., 2017). Meanwhile, other researchers such as Ahmad (2013), Luk (2013), and Patel and Sharma (2000) presented a similar finding that the appropriate marketing strategy would encourage consumers' motivation to shop and aggregately increase the turnover and performance of the shopping center. Based on the explanation above, the following hypothesis can be proposed:

H5: The stronger the shopping atmosphere, the higher the performance of shopping center

4. Methods

This was a comparative causality study (Sekaran, 2003). The populations in the current study were the managers of 4 Japanese-Indonesian joint venture shopping centers operated in Jakarta, Bekasi, Tangerang, and Bogor, 3 China-Indonesia joint venture shopping centers operated in Jakarta, Tangerang and Surabaya. Besides, 2 Singapore- Indonesia joint venture shopping centers operated in Jakarta and South Tangerang we also included. Purposive sampling technique was applied to obtain the samples. Data collection used questionnaires that were distributed to the managers as they were considered to have the most significant role in the management as well as the services performed in the shopping center. The researchers distributed 275 questionnaires and 218 managers filled in the questionnaire, and finally 180 questionnaires were qualified to be used in further stage of the study. The endogenous variable of this study was the performance of shopping centers, while the exogenous variables were shopping value creation, shopping atmosphere and the development of patronage ambidexterity as a novelty with the indicators of dexterity, ingenuity, empathy, support, exemplary, and future orientation.

All variables were measured by indicators provided to all respondents through questionnaires (Likert scale of 1-10). Pont 1 meant strongly disagree, while point 10 meant strongly agree. Data and hypotheses tests were conducted using the Structural Equation Model (SEM) with IBM AMOS version 22.0 software.

5. Results

5.1. Descriptive Analysis

The majority of respondents namely the shopping managers were male as many as 127 people (70.6%) and 53 respondents were female (29.4%). The majority of respondents aged 43 years and more as many as 66 people (37%), 61 respondents (34%) aged 36-42 years and 53 people (29%) aged 29-35 years. Based on the educational background, it was shown that 78 respondents (57%) had bachelor degree (43%) and 102 had post-graduate degree.

5.2. Suitability of the Model

Test on the SEM model was to see the suitability of the model. The feasibility test results of the full composite model are presented in the following table:

Goodnes of Fit Index	Cut off value	Estimation	Description
X^2-Chi square (df=2316)	-	4024.207	Marginal
CMIN/DF	≤2.00	1.738	Fit
Probability	≥0.05	0.061	Fit
6RMSEA	≤0.08	0.064	Fit
GH	≥0.90	0.933	Fit
AGFI	≥0.90	0.907	Fit
TLI	≥0.95	0.977	Fit
CFI	≥0.95	0.963	Fit
NFI	≥0.95	0.958	Fit

Table 1. Goodness of Fit Indices

The results of feasibility test as shown in the table above indicated a chi-square value (X^2) of 4024.207 which was still quite high. However, the model fitness based on other indices, namely CMIN/DF, probability, RMSEA, GFI, AGFI, TU, CFI and NFI showed a fit result since the estimated results were higher than cut off values.

6. Discussion

The output of the full SEM model is shown in the following table:

			Estimate	S.E.	C.R.	P	Description
Shopping Center Performance	←	Shopping Value Creation	.054	.054	-.853	.394	Not Significant
Patronage Ambidexterity Development	←	Shopping Value Creation	.451	.072	6.265	0.00	Significant
Shopping Center Performance	←	Patronage Ambidexterity Development	.364	.082	4.412	0.00	Significant
Shopping Atmosphere	←	Patronage Ambidexterity Development	.137	.057	2.390	.017	Significant
Shopping Center Performance	←	Shopping Atmosphere	.179	.090	2.970	.048	Significant

Table 2. Regression Weight of Hypothesis Test Using Full Model

The table above revealed that of the 5 correlations there were 4 significant causal correlations at the 5% significance level with CR of >2.00 and p-value of <0.05. Since the CR value was >2.00, it indicated that the correlation between variables in the model had a significant effect and thus, the developed hypothesis could be accepted. The correlations/effects were discussed as follows: (1) The creation of shopping value had a significant effect on the development of patronage ambidexterity. The result was in line with the finding of the studies conducted by Bandera-de-Mello, et al., (2016), Dhir, et al., (2018), Gupta (2015), Koryak et al., (2018) and Steen (2016). The conclusions of this study showed that there was a declined in the performance of shopping centers and there was contradiction regarding the creation of shopping value. It can be proven by the findings in this study that the creation of shopping value further increased the development of patronage ambidexterity but had no effect on the performance of shopping center. (2) The development of patronage ambidexterity had a significant effect on the performance of shopping centers. The result was supported by previous studies, including those conducted by Anic and Vouk (2015), Rahman, et al., (2016) and Rousseau and Venter (2014). In a novel perspective, the development of

patronage ambidexterity provided a solution from previous studies since it was proven to have significant effect on the performance of shopping center. (3) Development of ambidexterity patronage had a significant effect on the shopping atmosphere. The result of this study was supported by previous researchers who conducted studies on shopping atmosphere (Ajayi et al., 2017; Armor, 2015; Ertekin et al., 2014; Luotola and Reile, 2017; Suseno, 2019). (4) The shopping atmosphere had a significant effect on shopping center performance. This finding was in accordance with the results of several previous studies, among others those conducted by Ahmad, (2013); Chithralega, (2013); Luk, (2013) and Noh, et al (2017).

There was 1 correlation with the CR value of <2.0 and p-value of >0.05. Thus, the creation of shopping value had no significant effect on the managerial performance. The result was in line with the evidence presented by Boado (2009) and Sadeghi & Bijandi (2011) who stated that there was no correlation between the creation of shopping values and the performance of shopping center. The findings of this study was contradictive with the studies conducted by Gupta (2015) and Steen (2016) who explained that the creation of shopping value had a significant effect on the performance of shopping center. The basis of the problems in this study has been answered and was in line with the argument that there was no correlation between the creation of shopping value and the performance of shopping center.

7. Conclusions

The results revealed form all tests showed that of the 5 correlations observed there were 4 significant correlations at the level of significance. Meanwhile, 1 correlation namely the correlation between the creation of shopping value variable and managerial performance did not show a significant effect. Novelty offered in this study was the development of patronage ambidexterity that had been proven to be able to correlate the effect of the creation of shopping value on the performance of shopping center. In addition, the development of patronage ambidexterity had also been shown to have an effect on the shopping atmosphere, which in turn significantly affected the performance of shopping center.

8. Future Studies

There were several limitations in the study model used, one of which was that X^2-Chi-square had not been fit yet. Thus, the future studies should replicate this model for different industries or in the retail industry at different locus.

Reference

[1] Arnold, Todd J., Fang, Eric, Palmatier, Robert W. (2011). The effects of customer acquisition and retention orientations on a firm's radical and incremental innovation performance, *Journal of the Academy of Marketing Science*, Volume 39, Issue 2, pp 234-25.

[2] Anić, Ivan-Damir and Vouk, Rudolf (2015). Exploring The Relationships Between Store Patronage Motives And Purchasing Outcomes For Major Shopping Trips In The Croatian Grocery Retailing, *Ekonomski Pregled*, Vol. 56 (9) pp. 634-657.

[3] Armour, Alexandro F. (2015). *Achieving Contextual Ambidexterity Through the Implementation of High Performance Work Systems (HPWS)*. Dissertation, Georgia State University.

[4] Ajayi, Oluseyi Moses, Odusanya, Kayode, Morton, Susan (2017). Stimulating employee ambidexterity and employee engagement in SMEs", *Management Decision*, Vol. 55 Issue: 4, pp.662-680.

[5] Ahmad, Ala'Eddin Mohammad Khalaf (2012). Attractiveness Factors Influencing Shoppers' Satisfaction, Loyalty, and Word of Mouth: An Empirical Investigation of Saudi Arabia Shopping Malls, *International Journal of Business Administration*, Vol. 3, No. 6, pp. 102-111.

[6] Birkinshaw, Julian and Gibson, Cristina (2004). Building Ambidexterity into an Organization, *MITSloan Management Review*, Vol. 45, No. 4, pp. 47-61.

[7] O'Reilly III, Charles A. and Tushman, Michael L. (2013). Organizational Ambidexterity: Past, Present and Future, *Academy of Management Perspectives*, Harvard Business School.

[8] Bandeira-de-Mello, R., Fleury, M.T.L., Aveline, C.E.S. and Gama, M.A.B. (2016). Unpacking the ambidexterity implementation process in the internationalization of emerging market multinationals, *Journal of Business Research*, Vol. 69, No. 6, pp. 2005-2017.

[9] Boadu, Vincent Amanor (2009). In Search of a Theory of Shopping Value: The Case of Rural Consumers, *Review of Agricultural Economics*. Vol. 31, No. 3, pp. 589-603.

[10] Babin, B. J. and Babin, L. (2001). Seeing something different? A model of schema typicality, consumer affect, purchase intentions, and perceived shopping value. *Journal of Business Research*, 54, pp. 89-96.

[11] Bonnin, Ga¨el and Goudeyhe, Alain (2012). Kinetic quality of store design: An Exploration of its influence on shopping experience, *Journal of Retailing and Consumer Services*. 19, pp. 637-643.

[12] Chebat, Jean-Charles; Michon, Richard; Haj-Salem, Narjes and Oliveira, Sandra (2014). The effects of mall renovation on shopping values, satisfaction and spending behaviour, *Journal of Retailing and Consumer Services*. Vol. 21, pp. 610-618.

[13] Chithralega, J. (2013). A Study on Influence of Shopping Motivation, Mall Atmosphere and Value Relationship with Reference to Mega Malls in Chennai, International Journal of Marketing, *Financial Services & Management Research*, Vol. 2, No. 6, pp. 145-156.

[14] Dhir, S., Ongsakul, V. and Batra, I. (2018). Comprehending ambidexterity in the emerging-market context: the moderating role of learning capability and environmental dynamism on e-commerce firms' performance', *J. Global Business Advancement*, Vol. 11, No. 4, pp. 395-417.

[15] Ertekin, Z. Ozdamar, Bayraktaroglu, G. and Gurkaynak, N. (2014). Role of Shopping Motives, Age and Gender in Evaluating Retail Atmospheric Cues, *Asian Journal of Marketing*. Vol. 8 (1), pp. 24-48.

[16] Gladwin, Thomas N., James J. Kennelly and Tara-Shelomith Krause (1995). Shifting Paradigms for Sustainable Development: Implications for Management Theory and Research, *Academy of Management Review*. Vol. 20, No. 4, pp. 675-683.

[17] Gupta, Shaphali (2015). Effect of Shopping Value on Service Convenience, Satisfaction and Customer Loyalty: A Conceptual Framework, *SIBM Pune Research Journal*, Vol. X, December, pp. 78-92.

[18] Ho, Teck-Hua, Tang, Christopher S and Bell, David R. (1998). Rational Shooping Behavior and the Option Value of Variable Pricing, *Management Science*, Vol. 44, 22, pp.144-160.

[19] Hsu,Tsuen-Ho, Chiu,Yen-Ting Helena and Lee,Yi-Jung (2013). An Empirical Study of Store Environment Influence on Consumer Multi-Perceived Values toward Patronage Intentions, *European Retail Research*. Vol. 26, Issue II, pp. 19-46.

[20] Hillman, Ben (2014). *Patronage and Power: Local State Networks and Party-state Resilience in Rural China*, Stanford University Press.

[21] Koryak, O., Lockett, A., Hayton, J., Nicolaou, N. and Mole, K. (2018). Disentangling the antecedents of ambidexterity: exploration and exploitation, *Research Policy*, Vol. 47, No. 2, pp. 413-427.

[22] Jansen, Justin J. P., George, Gerard, Van den Bosch, Frans A. J., and Volberda, Henk W. (2008). Senior Team Attributes and Organizational Ambidexterity: The Moderating Role of Transformational Leadership. *Journal of Management Studies*. 45(5), pp. 982-1007.

[23] Luotola, Elina and Reile, Tammy (2017). *The Role of MCS in Supporting Different Ways of Organizing Ambidexterity*, (Thesis), School of Economics and Management, Lund University.

[24] Luk, STK (2013). *Shopping Motivation as a Moderator in Retail Service Evaluation*, https://espace.curtin.edu.au/bitstream/handle/20.500.11937/12554/200254_200254%20Sharma.pdf?sequence=2 download 23/12/2018.

[25] Mershman, Francis (2016). Feast of the Patronage of Our Lady, *The Catholic Encyclopedia*. Vol. 11. New York: Robert Appleton Company.

[26] Manns, J. (2010). Beyond Brudtland's Compromise, *Town & Country Planning*, August, pp. 337-340.
[27] Nosella, Anna, Cantarello, Silvia and Filippini, Roberto (2012). The intellectual structure of organizational ambidexterity: A bibliometric investigation into the state of the art, *Strategic Organization*, 10: 450-465.
[28] Noh, J.H; Lee, K.-W; Hwang, J. (2017). The Effect of Motivational Factor for Using SNSs on Tourist Attitude, *Tourism and Hospitality Management*, Vol. 23, No. 2, pp. 185-194.
[29] Pantano, Eleonora and Laria, Giuseppe (2012). Innovation in Retail Process: From Consumers' Experience to Immersive Store Design, *Journal Technology Management and Innovovation*, Vol. 7, Issue 3 pp. 194-206.
[30] Patel, Vipul and Sharma, Mahendra (2009). Consumers' Motivations to shop in Shopping Malls: A Study of Indian Shoppers, *Advances in consumer research*, Vol. 8 (2), pp.185-192.
[31] René Kemp, Saeed Parto, Robert B. Gibson (2005). Governance for sustainable development: moving from theory to practice, *Int. J. Sustainable Development*, Vol. 8, Nos. 1/2, pp. 12-30.
[32] Rodriguez, Antonio Nieto (2014). *Organisational Ambidexterity*, London Business School Review.
[33] Rahman, Osmud, Kay Wong, Ken Kwong, Yu, Hong (2016). The effects of mall personality and fashion orientation on shopping value and mall patronage intension, *Journal of Retailing and Consumer Services*. 28, pp. 155-164.
[34] Rosing, Kathrin, Frese, Michael, Bausch, Andreas (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership, *The Leadership Quarterly*. 22, pp. 956-974.
[35] Rousseau, G.G., & Venter, D.J.L. (2014). Mall shopping preferences and patronage of mature shoppers. *SA Journal of Industrial Psychology/SA Tydskrif vir Bedryfsielkunde*, 40(1), Art. #1175, 12 pages. http://dx.doi.org/10.4102/ sajip.v40i1.1175.
[36] Sadeghi, Tooraj and Bijandi, Fereshteh (2011). The Investigation of Shopping Behavior in Shopping Mall Environment in According to Female Values, *Asian Journal of Business Management Studies*. 2 (1): 33-46.
[37] Shankar, Venkatesh, Inman, J. Jeffrey, Mantrala, Murali, Kelley, Eileen, Rizley, Ross (2011). Innovations in Shopper Marketing: Current Insights and Future Research Issues, J*ournal of Retailing*, 87S (1) pp. S29-S42.
[38] Sohail, M. Sadiq (2013). A Study of Mall Shopping Behaviour and Patronage: Perspectives From An Emerging Nation, *Australian Journal of Basic and Applied Sciences*, 7(1) pp. 373-382.
[39] Sanal, Mehmet, Alpkan, Lütfihak, Aren, Selim, Sezen, Bülent and Ayden, Yüksel (2013). Linking Market Orientation and Ambidexterity to Financial Returns with the Mediation of Innovative Performance, *Journal of Economic and Social Research*, Vol. 15 (1) pp. 31-54.
[40] Sekaran, U. (2003). *Research Methods for Business, a Skill Building Approach*. 4 ed: John Wiley & Son, Inc.
[41] Steen, Julie C. (2016). How Customer Shopping Motivation Influences Perceived Design of the Retail Environment, *Atlantic Marketing Journal*. Vol. 5, No. 2, pp. 2-14.
[42] Suseno, Bambang Dwi (2019). The Strength of Justified Knowledge Sharing on Good Manufacturing Practices: Empirical Evidence on Food Beverage Joint Venture Company of Japan – Indonesia, *Quality-Access to Success*, Vol. 20, No. 170/June, pp. 130-135.
[43] Suseno, Bambang Dwi and Atmadja, Christiantius (2016). Technology transfer motive of managers in Eastern Asia: empirical results from manufacture industry in Banten province, Indonesia, *Problems and Perspectives in Management*, Vol. 14, Issue 2, pp 36-45.
[44] Turner, Neil, Swart, Juani and Maylor, Harvey (2013). Mechanisms for managing ambidexterity: A review and research agenda, *International Journal of Management Reviews*, Vol.15, Issue3, Pp. 317-332.
[45] Teller, Christoph, Reutterer, Thomas, Schnedlitz, Peter (2008). Hedonic and Utilitarian Shopper Types in Evolved and Created Retail Agglomerations. International Review of Retail, *Distribution and Consumer Research*, 18 (3), pp. 283-309.
[46] Vob, Jan Peter; Bauknecht, Dierk and Kemp Rene (2006). *Reflexive Governance for Sustainable Development*, MERIT, Maastricht University, The Netherlands.
[47] Wulf, Torsten, Stubner, Stephan, and Blarr, Henning W. (2010). *Ambidexterity and the Concept of Fit in Strategic Management – Which Better Predicts Success?* Working Paper No. 89, Leipzig Graduate School of Management, Germany.
[48] Mohelska, Hana, Sokolova, Marcela (2018). Trends in the Development of Organizational Culture – A Case Study in the Czech Republic, *Transformations in Business & Economics*, Vol. 17, No 1 (43), pp. 50-63.
[49] https://www.sarinah.co.id/id/company-profile/company-history, accessed on 28th of July 2020.

Knowledge Sharing and Innovative Work Behavior as the Keys to Success in Improving SMEs Performance

Ahmad FIRDAUS[1*], Eeng AHMAN[2], DISMAN[3], Edi SURYADI[2]

[1,2,3,4]Universitas Pendidikan Indonesia, Bandung, Indonesia
[*]Corresponding author; E-mail: daus.husin2@gmail.com

Abstract

This paper aims to identify the effect of knowledge sharing and innovative work behavior on SMEs performance. Literature and previous research implied that knowledge sharing can increase individual knowledge. Knowledge is information, experience, understanding, expertise and skills. Knowledge is the basis for ideas, but the process of changing an idea into innovation can be facilitated by innovative work behavior. We investigated those opinions, in relation to SMEs performance, by using survey method, with a sample of 170 more-than-10-years-old SMEs in Indonesia. The results of this study will show the influence of knowledge sharing on innovative work behavior and the effect of both on SMEs performance.

Keywords: *knowledge sharing; innovative work behavior; SMEs performance.*

1. Introduction

In many developing countries, small and medium enterprises (SMEs) contribute greatly on economic growth and in reducing unemployment and poverty (Ayyagari, Beck and Demirguc-kunt, 2007; Rexhepi, 2014). These are the reasons many countries try to increase the growth of SMEs. The main problem of SMEs is competition with large companies that already have good procedures and work processes (Xerri and Brunetto, 2011). But SMEs could be more competitive if they optimize innovation because SMEs have heterogeneous characters (Kaufmann and Todtling, 2002). SMEs are more flexible in accepting changes in the business environment than large companies (Rosenbusch, Brinckmann and Bausch, 2011).

There is no business organization that can compete and survive by continuously producing the same products and services (Amabile, 1997). Innovation is the solution (Drucker, 1989). Innovating means bringing new things and making a new change (Jain and Ravindra, 2010). The study of innovation has been continuously growing from just a new invention to every aspect, including products, services, methods and strategies (Rogers and Everett, 2003), as well as leading towards individual behavior (West and Farr, 1989; Kim and Park, 2017). Individual behavior that creates and applies new ideas to be used is innovative work behavior (IWB) (West and Farr, 1989).

According to Adams, Day and Dougherty (1998); Tamer Cavusgil, Calantone and Zhao (2003), one of the keys to success in innovating is knowledge. The opportunity to generate ideas and knowledge is through the process of knowledge exchange and complementing knowledge, which are known as knowledge sharing (KS) (Van den Hooff and De Leeuw van Weenen, 2004; Abdallah, Khalil and Divine, 2012. (Lin, 2007) defined KS as a social interaction among individuals in transferring knowledge and skills. Hansen and Avital (2005) described KS as individual behavior voluntarily providing access to others about their knowledge and experience. Another perspective explained that KS is a collection of knowledge in groups, teams, divisions and business units, with the aim of generating added value for the company (Dell and Grayson, 1998; Liebowitz, 1999; Xiong and Deng, 2008). KS can also be implemented between partners outside the organization (Madhok and Tallman, 1998).

As many as 98.7% of enterprises in Indonesia are dominated by micro enterprises, 1.20% small enterprises, 0.09% medium enterprises and the rest is big enterprises. It shows a slow business growth indicated by the domination of micro enterprises. Business growth is related to corporate survival and organizational performance (Rexhepi, 2014). Performance is considered successful if the goal can be achieved at individual, team, or organizational level (Donelly, Gibson and Ivancevich, 1994). In this study, we explore the effect of KS and IWB on SMEs performance in Indonesia.

2. Literature Review

Studies on innovation in previous literature only focused on the field of research and development, where something new is found. But the paradigm has changed (Rogers and Everett, 2003), innovation is carried out by organizations to deal with changes in environmental conditions including competition and technological changes so that innovation is applied to all aspects, namely products, services, methods and strategies (Utterback, 1994; Dougherty and Hardy, 1996; Razavi and Attarnezhad, 2013). Since the basis of innovation is ideas and individuals are the source of ideas (Mumford, Whetzel and Reiter palmon, 1997), then this study also leads to individual behavior (West and Farr, 1989).

According to West and Farr (1989), IWB is the behavior of individuals who create and implement new ideas or new things in a team or organization to be utilized in improving the performance of the team or organization. Furthermore, Messmann (2012) said that IWB is the sum of individual or team physical and cognitive work activities for the purpose of developing

innovation. Many factors drive IWB, such as social, political and pressure in competition (external), as well as interactions with leaders and teams (internal) (Nijenhuis, 2015).

The stages of individual innovation begins with four main tasks, namely idea generation or the emergence of an idea by innovators; coalition building or the establishment of cooperation and the strength needed to realize an idea; idea realization or a process to convert an idea into a model or concept; and transfer or spreading the model (Kanter, 1988). But Scott and Bruce (1994) explained IWB as a set of three different behavioral tasks, namely idea generation, coalition building and implementation. It was supported by Janssen (2000) who stated that IWB can be measured with three stages, namely idea generation, idea promotion or coalition building and idea realization or implementation. The individual creates an idea and seeks to promote it and then realizes it into a model that is ultimately to be used. In another study by Dorenbosch, Engen and Verhagen (2005), they assumed that IWB only consists of two stages, namely creativity and implementation. Creativity includes problem recognition and idea generation, while implementation includes idea promotion and idea realization. But Jong, Hartog and Zoetermeer (2003) and Jong and Hartog (2008) saw IWB as a systematic activity that has different stages, namely opportunity exploration or the process to identify and look for opportunities or problems that need to be resolved; idea generation or the creation of idea and concept by combining knowledge or information; championing or the transfer and development of idea; and application or the process to realize and evaluate. However, without enough information and knowledge, individuals will not be able to produce ideas for innovation (Zhou and George, 2001).

In a new business perspective, many researchers agreed that the most important resource is knowledge (Schultze and Leidner, 2002; Bhojaraju, 2005; Jelenic, 2011; Hegazy and Ghorab, 2014; Khan, 2014; Xue, 2017). Knowledge can be tacit and explicit. Tacit is knowledge contained in the minds of individuals based on their understanding and experience. This type of knowledge can be transferred effectively through person to person. On the other hand, explicit is knowledge that has been documented and can be accessed and studied (Miller, 1998; Wyatt, 2004). This understanding was supported by Alavi, Kayworth and Leidner (2005), Chang and Lin (2015), as well as Anand and Walsh (2016). Knowledge is information, experience, understanding, expertise and skills that can be used as a basis for doing action and decision making. Therefore, knowledge management becomes important for organizations (Rahimli, 2012; OuYang, 2014). Knowledge management is a process of creating, managing, maintaining, increasing and sharing knowledge for organizational purposes (Gurteen, 1999; Argote and Ingram, 2000). The key to the success of knowledge management is how to motivate individuals to contribute by sharing knowledge.

KS is a relationship between two parties, one side gives knowledge and the other side gets knowledge (Hendriks, 1999). KS is defined as the behavior of individuals helping others by giving or exchanging knowledge to be used (Connelly, 2000; Ipe, 2003; Zheng, 2017). Nonaka and Takeuchi (1995) said that the purpose of KS is knowledge generation. In other words, KS is expected to be able to bring new knowledge. Many scholars are interested in finding factors influencing KS behavior. Lin (2007) explained the factors that can influence KS behavior, including organizational culture: employee motivation; leadership; and technology, while Cheng (2009) distinguished them based on three groups: organizational factors; individual factors; and technological factors. KS activities can be measured by two activities: knowledge donating or active communication among employees or partner organizations towards their intellectual capital; and knowledge collecting or the collection of information from employees or partner organizations (Van den Hooff and de Ridder, 2004; Lin, 2007; Dysvik, Buch and Kuvaas, 2015).

3. Theoretical Framework and Hypothesis Development

According to Kim and Park (2017), innovation is related to individual behavior. Organizations that stimulate KS behavior of their employees will be able to develop innovation and improve performance (Howell and Shea, 2001; Lin, 2007). Individuals involved in innovation seek to manage, describe, translate and disseminate the knowledge (Quintane et al., 2017). Radaelli et al. (2014) and Akram et al., (2018) proved that KS has a positive effect on IWB. They explained the direct effect of KS that can facilitate innovation and its indirect effect which can create social conditions (exchange of new knowledge) for innovation.

H1: Knowledge sharing (KS) has a positive effect on innovative work behavior (IWB)

According to Jong and Hartog (2008), individual behavior that introduces new ideas, processes, products, or procedures is needed for organizational development and can improve organizational performance. Individuals with innovative behavior can respond to various changes and generate creative ideas for effective and efficient work methods (Janssen, 2000; Yuan and Woodman, 2010). Dorner (2012) supported the study, in which the results of their study show that innovative work behavior has a positive and significant effect on organizational performance. Innovative work behavior can influence the achievement of organizational goals (Radaelli et al., 2014).

H2: Innovative work behavior (IWB) has a positive effect on SMEs performance

To achieve high performance, a company needs a good system. Management system that manages the intellectual as an asset is KS behavior (Van den Hooff and de Ridder, 2004). Ngah and Ibrahim (2010) in their study proved that knowledge management, which is basically based on knowledge sharing variables, is very influential on the performance of SMEs. Knowledge sharing is very important for performance achievement (Bartol and Srivastava, 2002).

H3: Knowledge sharing (KS) has a positive effect on SMEs performance

4. Research Methodology

This research is a type of survey research with an explanatory purpose. Sampling technique used was proportional sampling method. The samples were 170 SME owners, in which the SMEs have the characteristics of more than 10 years of age established in Indonesia. Data were collected using questionnaires given directly to respondents. The questionnaires consisted of two parts. The first part contains questions to obtain respondent's personal data and the second part contains questions using a semantic differential scale to determine the respondent's attitude towards the construct studied. The analytical tool used was Structural Equation Modeling (SEM).

5. Results and Discussions

5.1. Respondent Characteristics

The following is the characteristics of respondents based on gender, respondent age, type of business, field of business, and age of the SMEs.

Demographics	Characteristics	Number	Percentage
Sex	Male	143	84.11
	Female	27	15.88
Education	High School	34	20
	Bachelor Degree	111	65.3
	Master Degree	25	14.7
Enterprise Scale	Small	137	80.59
	Medium	33	19.41
Sector	Food	68	40
	Fashion	53	31.17
	Agriculture	17	10
	Education	8	4.7
	Transportation	13	7.64
	Others	11	6.47

Table 1. Characteristics of Respondents

5.2. Measurement Model, Validity and Reliability Test

We used confirmatory factor analysis for measurement models (Hooper, Coughlan and Mullen, 2008). KS was measured using two dimensions: knowledge collecting and knowledge donating. IWB was measured by four dimensions: opportunity exploration, idea generation, championing and application. SMEs performance was measured by three dimensions: market share, sales growth and profitability. The results can be seen in Table 2.

Variable	Dimension	Indicators	Loading Factor (Standardized)	CR	AVE
Knowledge Sharing	Knowledge Collecting	KS1; KS2; KS3	0.824; 0.786; 0.815	0.927	0.678
	Knowledge Donating	KS4; KS5; KS6	0.843; 0.840; 0.830		
Innovative Work Behavior	Opportunity exploration	IWB1; IWB2	0.801; 0.754	0.909	0.556
	Idea generation	IWB3; IWB4	0.755; 0.778		
	Championing	IWB5; IWB6	0.759; 0.664		
	Application	IWB7; IWB8	0.733; 0.711		
SMEs Performance	Market Share	SP1; SP2	0.774; 0.780	0.912	0.566
	Sales Growth	SP3; SP4; SP5	0.708; 0.760; 0.615		
	Profitability	SP6: SP7; SP8	0.745; 0.806; 0.813		

Fit Index of CFA:
Chi Square = 274.268; df = 206; P-value = 0.001;
RMSEA = 0.044; AGFI = 0.844; CFI = 0.97; TLI = 0.967

Table 2. Confirmatory Factor Analysis

According to Table 2, loading factor of all indicators measuring the constructs is more than 0.5 (> 0.5), the construct reliability (CR) value is more than 0.7 (> 0.7) and the average variance extracted (AVE) value is more than 0.5 (> 0.5), so that all indicators can be used as measuring instruments for all constructs in this study.

5.3. Hypothesis Test

Hypothesis testing in this study used P-value and critical ratio (CR). If P-value is less than 0.05 and the CR value is more than 1.96, the hypothesis proposed can be accepted. The results of using structural equation modeling can be seen in Table 3.

Hypothesis	Estimate	SE	CR	P	Result
H_1: KS has a positive effect on IWB	0.457	0.063	7.231	< 0.01	Accepted
H_2: IWB has a positive effect on SMEs Performance	0.598	0.115	5.176	< 0.01	Accepted
H_3: KS has a positive effect on SMEs Performance	0.132	0.079	1.662	0.097	Rejected

Table 3. Hypothesis Test

5.4. Discussion

Table 3 shows that the first hypothesis is accepted, CR = 7.231 (> 1.96) and P-value <0.01, KS has a positive and significant effect on IWB, the results of this study support by previous research (Liu and Philips, 2011; Yesil and Dereli, 2013; Radaelli et al., 2014), with increasing KS, can be a positive effect on IWB in the organization. Individuals who continue to manage knowledge and disseminate knowledge will be able to behave innovatively (Quintane et al., 2017). Another study supporting this research was explained by Akram et al., (2018), they tried to compare the influence of two dimensions of knowledge sharing, namely knowledge collecting and knowledge donating on IWB in the telecommunications industry in China, the results of their study found that knowledge collecting contributed more to the increase in IWB compared to donating it, this indicates that individuals will have the ability to innovate when they receive a lot of knowledge about their work, Radaelli et al., (2014) that individuals who are able to collect knowledge from the workplace will be able to improve their ability to innovate.

The second hypothesis test results are accepted, the value of CR = 5.176 (> 1.96) and the P-value = <0.01, IWB has a positive and significant effect on SMEs performance. Many researchers see the effect of IWB on individual performance but not on organizational performance, but the results of this study support studies related to innovation (Oldham and Cummings, 1996; Hulsheger, Salgado and Anderson, 2009; Korzilius, Beerlage and Bucker, 2017) that the foundation in improving organizational performance is individual innovation. Organizational performance can be improved through creative ideas that come from individuals in response to changes in the organizational environment (Janssen, 2000; Yuan and Woodman, 2010; Dorner, 2012)

The results of the third hypothesis test were rejected, CR value = 1.662 (<1.86) and P-value = 0.097 (> 0.05), KS had no significant effect on SP, in contrast to previous studies by Ngah and Ibrahim (2010); this study actually found that KS did not have a direct influence on SMEs performance, but we also tested the mediation effect of IWB on KS and SMEs performance using the Sobel test, the Sobel test value is 4,226 greater than 1.96 with a P-value <0.005 so that the KS in this study had an indirectly effect on SMEs performance if mediated by IWB, this result supported by Setyanti and Farida (2016) part of the results of their hypothesis test explains that there is a positive and significant effect indirectly from KS on SMEs performance mediated by product innovation, product innovation is come from IWB.

6. Conclusion

According to the results and discussion in this study, it can be concluded that KS has a positive and significant effect on IWB and IWB has a positive and significant effect on SMEs performance. However, KS does not directly affect SMEs performance. KS can only have a positive and significant effect if mediated by IWB.

IWB is a solution for SMEs in Indonesia to be able to develop and compete within business environment, but the basis of IWB is knowledge. This is where the role of the KS and knowledge can be increased when it is shared and transferred by individuals. Individuals who have knowledge can manage and combine knowledge into an idea that can foster innovation in the process, method, products and services that can improve organizational performance.

References

[1] Abdallah, S., Khalil, A. and Divine, A. (2012). 'the Impact of Knowledge Sharing on Innovation Capability in United Arab Emirates Organizations', International Journal of Social, Behavioral, Educational, Economic, *Business and Industrial Engineering*, 6(12), pp. 955-958.

[2] Adams, M. E., Day, G. S. and Dougherty, D. (1998). 'Enhancing New Product Development Performance: An Organizational Learning Perspective', *Journal of Product Innovation Management*, 15(5), pp. 403-422.

[3] Akram, T. et al. (2018). 'Exploring the Impact of Knowledge Sharing on the Innovative Work Behavior of Employees: A Study in China', *International Business Research*, 11(3), p. 186.

[4] Alavi, M., Kayworth, T. R. and Leidner, D. E. (2005). 'An Empirical Examination of the Influence of Organizational Culture on Knowledge Management Practices', *Journal of Management Information System*, 22(3), pp. 191-224.

[5] Amabile, T. M. (1997). *Motivating Creativity in Organizations: On Doing What You Love and Loving What You Do*. University of California.

[6] Anand, A. and Walsh, I. (2016). 'Should Knowledge Management be Shared Generously? Tracing Insights from Past to Present and Describing a Model', *Journal of Knowledge Management*, 20(4), pp. 713-730.

[7] Argote, L. and Ingram, P. (2000). 'Knowledge transfer: A basis for competitive advantage in firms', *Organizational Behavior and Human Decision Processes*, 82(1), pp. 150-169.
[8] Ayyagari, M., Beck, T. and Demirguc-kunt, A. (2007). 'Small and medium enterprises across the globe', *Small Business Economics*, 29, pp. 415-416.
[9] Bartol, K. M. and Srivastava, A. (2002). 'Encouraging Knowledge Sharing: The Role of Organizational Reward Systems', *Journal of Leadership & Organizational Studies*, 9(1), pp. 64-76.
[10] Bhojaraju (2005). 'Knowledge Management: Why Do We Need It For', *Malaysian Journal of Library & Information Science*, 10(2), pp. 37–50.
[11] Chang, C. L. and Lin, T.-C. (2015). 'The Role of Organizational Culture in the Knowledge Management Process', *Journal of Knowledge Management*, 19(3), pp. 433-455.
[12] Cheng, N. (2009). 'Knowledge Sharing and Knowledge Broker of Organizatons', *International Conference on Future Information Technology and Management Engineering*.
[13] Connelly, C. (2000). *Predictors of Knowledge Sharing in Organizations*. Queen's University.
[14] Dell, C. O. and Grayson, C. J. (1998). 'If Only We Knew What We Know: Identification and Transfer of Internal Best Practices', *California Management Review*, 40(3), pp. 154-174.
[15] Donelly, J. H., Gibson, J. L. and Ivancevich, J. (1994). *Fundamental of Management*. Texas: Business Publication.
[16] Dorenbosch, L., Engen, M. L. Van and Verhagen, M. (2005). 'On-the-job Innovation: The Impact of Job Design and Human Resource Management through Production Ownership', *Creativity and Innovation Management*, 14(2), pp. 129-141.
[17] Dorner, N. (2012). *Innovative Work Behavior: The Roles of Employee Expectations and Effects on Job Performance*. University of St.Gallen.
[18] Dougherty, D. and Hardy, C. (1996). 'Sustained Product Innovation in Large, Mature Organizations: Overcoming Innovation to Organization Problem', *Academy of Managament Journal*, 39(5), pp. 1120-1153.
[19] Drucker, P. (1989). *The new realities*. New York: Harper & Row.
[20] Dysvik, A., Buch, R. and Kuvaas, B. (2015). 'Knowledge donating and knowledge collecting: The moderating roles of social and economic LMX', *Leadership and Organization Development Journal*, 36(1), pp. 35-53
[21] Gurteen, D. (1999). 'Creating a Knowledge Sharing Culture', *Knowledge Management Magazine*, 2(5), pp. 1-4.
[22] Hansen, S. and Avital, M. (2005). '*Share and Share Alike: The Social and Technological Influences on Knowledge Sharing Behavior*', Working Papers on Information System.
[23] Hegazy, F. M. and Ghorab, K. E. (2014). 'The Influence of Knowledge Management on Organizational Business Processes ' and Employees ' Benefits', *International Journal of Business and Social Science*, 5(1), pp. 148-172.
[24] Hendriks, P. (1999). 'Why Share Knowledge? The Influence of ICT on the Motivation for Knowledge Sharing', *Knowledge & Process Management*, 6, pp. 91-100.
[25] Van den Hooff, B. and De Leeuw van Weenen, F. (2004). 'Committed to share: Commitment and CMC use as antecedents of knowledge sharing', *Knowledge and Process Management*, 11(1), pp. 13-24.
[26] Van den Hooff, B. and de Ridder, J. A. (2004). 'Knowledge sharing in context: the influence of organizational commitment, communication climate and CMC use on knowledge sharing', *Journal of Knowledge Management*, 8(6), pp. 117-130.
[27] Hooper, D., Coughlan, J. and Mullen, M. (2008). 'Structural Equation Modeling: Guidelines for Determining Model Fit', *Journal of Business Research Methods*, 6(1), pp. 53-60.
[28] Howell, J. M. and Shea, C. M. (2001). 'Individual differences, environmental scanning, innovation framing, and champion behavior key predictors of project performance', *Journal of Product Innovation Managament*, 18, pp. 15-27.
[29] Hulsheger, U. R., Salgado, J. F. and Anderson, R. (2009). 'Team-Level Predictors of Innovation at Work: A Comprehensive Meta-Analysis Spanning Three Decades of Research', *Journal of Applied Psychology*, 94(5), pp. 1128-45.
[30] Ipe, M. (2003). 'Knowledge Sharing in Organizations: A Conceptual Framework', *Human Resource Development Review*, 2, pp. 337-359.
[31] Jain and Ravindra (2010). 'Innovation in Organizations: A Comprehensive Conceptual Framework for Future Research', *South Asian Journal of Management*, 17(2), pp. 81-111.
[32] Janssen, O. (2000). 'Job demands, perceptions of effort–reward fairness and innovative work behaviour', *Journal of Occupational and Organizational Psychology*, 73(73), pp. 287-302.
[33] Jelenic, D. (2011). 'The Inportance of Knowledge Management in Organizations - With Emphasis on The Balanced Scorecard Learning and Growth Perspective', *Management, Knowledge and Learning*, pp. 33-43.
[34] Jong, J. De, Hartog, D. Den and Zoetermeer (2003). *Leadership as a determinant of innovative behaviour A conceptual framework*. Scientific Analysis of Entrepreneurship and SMEs.
[35] Jong, J. P. J. de and Hartog, D. N. Den (2008). *Innovative Work Behaviour: Measurement and Validation*. Scientific Analysis of Entrepreneurship and SMEs.
[36] Kanter, R. M. (1988). 'Three Tiers for Innovative Research', *Communication Research*, 15(5), pp. 509-523.
[37] Kaufmann, A. and Todtling, F. (2002). 'How effective is innovation support for SMEs? An analysis of the region of Upper Austria', *Technovation*, 22, pp. 147-159.
[38] Khan, R. A. (2014). 'Sustainable Competitive Advantage through Knowledge Management', *International Journal of Advanced Research in Computer Engineering & Technology*, 3(4), pp. 1079-1082.
[39] Kim, W. and Park, J. (2017). 'Examining structural relationships between work engagement, organizational procedural justice, knowledge sharing, and innovative work behavior for sustainable organizations', *Sustainability*, 9(2), pp.1-16.
[40] Korzilius, H., Beerlage, S. and Bucker, J. (2017). 'Multiculturalism and Innovative Work Behavior: The Mediating Role of Cultural Intelligence', *International Journal of Intercultural Relations*, 56, pp. 13-24.
[41] Liebowitz, J. (1999). *Knowledge Management Handbook*. Boca Raton: CRC Press, Inc.
[42] Lin, H. (2007). 'Knowledge sharing and firm innovation capability: an empirical study', *International Journal of Manpower*, 28(3), pp. 315-332.
[43] Liu, Y. and Philips, J. S. (2011). 'Exmining the Antecedents of Knowledge Sharing in Facilitating Team Innovativeness From a Multilevel Perspective', *International Journal of Information Management*, 31(1), pp. 44-52.
[44] Madhok, A. and Tallman, S. B. (1998). 'Resources , Transactions and Rents: Managing Value through Interfirm Collaborative Relationships', *Organization Science*, 9(3), pp. 326-339.
[45] Messmann, G. (2012). *Innovative work behaviour Investigating the nature and facilitation of vocational teachers*. Regensburg University.
[46] Miller, P. (1998). *Mobilising the Power of What You Know*. London: Random House.
[47] Mumford, M. D., Whetzel, D. and Reiter-palmon, R. (1997). 'Thinking Creatively at Work: Organization Influences on Creative Problem Solving', *Journal of Creative Behavior*, 31(1), pp. 1-17.
[48] Ngah, R. and Ibrahim, A. R. (2010). 'The Effect of Knowledge Sharing on Organizational Performance in Small and Medium Enterprises', *Proceedings of Knowledge Management 5th International Conference 2010*, (Stewart 2000), pp. 503-508.
[49] Nijenhuis, K. (2015). I*mpact Factors For Innovative Work Behavior in The Public Sector*, University of Twente.

[50] Nonaka, I. and Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford University Press.
[51] Oldham, G. R. and Cummings, A. (1996). 'Employee Creativity: Personal and Contextual Factors at Work', *Academy of Management Journal*, 39, pp. 607-634.
[52] OuYang, Y. (2014). 'A Cyclic Model for Knowledge Management Capability-A Review Study', *Arabian Journal of Business and Management*, 4(4), pp. 1-9.
[53] Quintane, E. et al. (2017). 'Innovation as a knowledge-based outcome', *Journal of Knowledge Management*, 15(6), pp. 928-947.
[54] Radaelli, G. et al. (2014). 'Knowledge sharing and innovative work behaviour in healthcare: A micro-level investigation of direct and indirect effects', *Creativity and Innovation Management,* 23(4), pp. 400-414.
[55] Rahimli, A. (2012). 'Knowledge Management and Competitive Advantage', *Information and Knowledge Management*, 2(7), pp. 37-43.
[56] Razavi, S. H. and Attarnezhad, O. (2013). 'Management of Organizational Innovation', *International Journal of business and Social Science*, 4(1), pp. 226-232.
[57] Rexhepi (2014). 'The impact of innovation in SME ' s performance', *International Scientific Journal* (Special Edition) Economics, 12.
[58] Rogers, E. M. and Everett, M. (2003). *Diffusion of Innovation*. Third. Collier Macmillan Publisher.
[59] Rosenbusch, N., Brinckmann, J. and Bausch, A. (2011). 'Is innovation always bene fi cial? A meta-analysis of the relationship between innovation and performance in SMEs', *Journal of Business Venturing*. Elsevier Inc., 26(4), pp. 441-457.
[60] Schultze, U. and Leidner, D. E. (2002). 'Studying Knowledge Management in Information System Research: Discourses and Theoretical Assumptions', *MIS Quarterly*, 26(3), pp. 213-242.
[61] Scott, S. G. and Bruce, R. A. (1994). 'Determinants of Innovative Behaviour: A Path Model of Individual Innovation in The Workplace', *Academy of Managament Journal*, 37(3), pp. 580-607.
[62] Setyanti, S. W. L. H. and Farida, L. (2016). 'The Effect of Knowledge Sharing on Business Performance Moderated by Innovation Product In The Small And Medium Enterprises In Indonesia', *International Journal of Scientific & Technology Research*, 5(11), pp. 209-211.
[63] Tamer Cavusgil, S., Calantone, R. J. and Zhao, Y. (2003). 'Tacit knowledge transfer and firm innovation capability', *Journal of Business & Industrial Marketing*, 18(1), pp. 6-21.
[64] Utterback, J. (1994). '*Mastering the Dynamics of Innovation: How Companies Can Seize Opportunities in the Face of Technological Change*', University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.
[65] West, M. A. and Farr, J. L. (1989). 'Innovation at Work: Psychological Perspectives', *Social Behavior*, 4, pp. 15-30.
[66] Wyatt, J. C. (2004). 'Management of Explicit and Tacit Knowledge', *Journal of The Royal Society of Medicine*, 94, pp. 6-9.
[67] Xerri, M. and Brunetto, Y. (2011). 'Fostering the innovative behaviour of SME employees: A social capital perspective', *Research and Practice in Human Resource Management*, 19(2), pp. 43-59.
[68] Xiong, S. and Deng, H. (2008). 'Critical Success Factors for Effective Knowledge Sharing in Chinese Joint Ventures', in *ACIS 2008 Proceedings*.
[69] Xue, C. T. S. (2017). 'A Literature Review on Knowledge Management in Organizations', *Research in Business and Management*, 4(1), pp. 30-41.
[70] Yesil, S. and Dereli, S. F. (2013). 'An Empirical Investigation of the Organizational Justice, Knowledge Sharing and Innovation Capability', *Procedia - Social and Behavioral Sciences*, 75(3), pp. 199-208.
[71] Yuan, F. and Woodman, R. W. (2010). 'Innovative Behavior in the Workplace: The Role of Performance and Image Outcome Expectations', *Academy of Management Journal*, 53(2), pp. 323-342.
[72] Zheng, T. (2017). 'A Literature Review on Knowledge Sharing', *Open Journal of Social Science*, 5, pp. 51-58.
[73] Zhou, J. and George, J. M. (2001). 'When Job Dissatisfaction Leads to Creativity: Encouraging The Expression of Voice', *Academy of Management Journal*, 44(4), pp. 682-696.

Factors Influencing Corporate Concern on Public Health: Insights from Indonesia

Roni BUDIANTO[1*], Eko SUYONO[2]

[1]Doctorate Student of Syari'a Banking, Faculty of Economics and Business,
Islamic State University Syarif Hidayatullah Jakarta, Indonesia; E-mail: roni_budianto19@mhs.uinjkt.ac.id
[2]Faculty of Economics and Business, Jenderal Soedirman University, Indonesia; E-mail: ekyo75@unsoed.ac.id
[*]Corresponding author

Abstract

This study aims to evaluate several factors influencing corporate concern on public health (i.e., family ownership, profitability, and firm size). This study measures the variable of public health by using corporate social responsibility based on Global Reporting Initiative (GRI) indicators indicating public health concern (i.e., water and effluents, emission, effluents and waste, occupational health and safety, and customer health and safety). Implementing a purposive sampling method, this study ended up with 32 manufacturing companies as a sample for the 2014-2018 periods (i.e., 160 observations). By using OLS regression, the findings show that almost independent variables have a positive association with corporate concern on public health except for family ownership. With its limitation such as the relatively low number of samples, however, on the best of our knowledge, it is the first study that evaluates corporate concern on public health by using GRI indicators related to public health. Therefore, this study contributes to providing empirical evidence on this issue particularly in an emerging market context, i.e., Indonesia.

Keywords: *corporate concern on public health; family ownership; profitability; firm size; GRI indicators related to public health.*

1. Introduction

The corporate concern on public health can be seen from their Corporate Social Responsibility (hereafter, CSR) activities, where several CSR activities directly related to public health. CSR itself has become a global trend with the increasing level of public concern on environmental issues including public health issues. From a CSR perspective, good companies are not only concerned with economic benefits but also have concern for environmental sustainability and public welfare (Suyono, 2011; Aguinis & Glavas, 2012; Arnold & Valentin, 2013; Suyono & Farooque, 2018).

The public concern of the importance of practicing CSR disclosure increases with the increasingly widespread public awareness of products that are environmentally friendly and are produced by paying attention to social and human rights principles and public health impact. For example, the lending policies by European banks where they only provide loans to plantation companies in Asia if there is a guarantee from those companies that the process of clearing plantations is not done by burning forests which damages environment and impacts negatively on public health (Ioannou & Serafeim, 2012; Jamali & Karam, 2018; Jamali et al., 2017; Suyono & Farooque, 2018).

The CSR activities in Indonesia are motivated by several cases regarding the negative impact of corporate activities on the environment and public health. Several examples are the case of PT Vale Indonesia, PT. Freeport Indonesia, PT. Newmont in Buyat and PT. Lapindo Brantas. Their activities have polluted the environment so that it has a negative impact on public health. These cases occurred due to the company's lack of attention to the environment and society by over-exploiting existing resources not according to established rules (Suyono, 2011; Suyono & Farooque, 2018).

Moreover, a study by Sharma (2013) states that companies in Indonesia have a lower quality of CSR compared to those companies in Singapore and Thailand. The results of the study explained that Thailand became the country with the highest quality CSR scored at 56.8 out of a total of 100, Singapore is 48.8, while Indonesia and Malaysia are 48.4 and 47.7 respectively.

Many previous studies have examined the effect of CSR disclosure on company performance (e.g., Shauki, 2011; Waagstein, 2011; Suyono. 2011; Ararat et al., 2018; Fanti & Buccella, 2018; etc). Conversely, only little literature that presents the influence of company performance on CSR Disclosure, such as Nawaiseh et al. (2015) in Jordan, Wakid et al. (2013), Hermawan and Mulyawan (2014), Dhiyaul-Haq and Santoso (2016), and Nasution et al. (2018) in Indonesia. Moreover, this study is the first to measure the CSR with put specific attention on indicators related to public health.

Nawaiseh et al. (2015) found that ROE is positively related to CSR disclosure while ROA does not have a significant relationship. Likewise, firm size is not significantly related to CSR disclosure. This finding is in line with the results of Wakid et al. (2013), in Indonesia. In another side Hermawan and Mulyawan (2014) concluded that there is very little correlation between company performance and the quality of CSR disclosure in Indonesia, which indicates that CSR disclosure is intended to maintain the company's reputation in front of shareholders, not to allocate a portion of company profits in CSR activities.

Furthermore, Dhiyaul-Haq and Santoso (2016) also proved that profitability (Return on Assets) and family ownership do not have a significant effect on the CSR disclosure by Islamic

Commercial Banks registered in the Financial Services Authority during the period 2010-2014 in Indonesia. Similarly, Nasution et al. (2018) found that profitability is not significantly related to CSR disclosure in Indonesian public companies.

Several studies have proved that different countries provide different characters of disclosing social activities (Suyono, 2011; Aguinis & Glavas, 2012; Arnold & Valentin, 2013; Suyono & Farooque, 2018), which may derived from the behaviour of the companies and regulatory requirements (Suyono, 2011; Waagstein, 2011; Suyono & Farooque, 2018).

Based on the findings of the previous studies showing varied and inconsistent results, this study tries to examine the effect of family ownership, profitability, and company size on corporate concern for public health. The main focus of this study is to evaluate the link between the company's financial performance which is measured by ROA as a proxy of profitability and CSR disclosure in public health related indicators by considering the presence of family ownership and firm size, in the Indonesian context.

2. Theoretical Framework and Hypotheses Development

2.1. Theoretical Framework

Stakeholder theory states that all stakeholders have the right to obtain information concerning the company activities that can influence their decision making (Deegan, 2002). It reveals that a company does not only operate for its own sake but must also benefit its stakeholders (Suyono & Farooque, 2018). Thus, the existence of a company is strongly influenced by the support given by all stakeholders. Therefore, the company must accommodate their desires and needs, especially those who have the power to influence corporate success in achieving their goal such as customers, labor, etc. One strategy that companies use to maintain the relationship with their stakeholders is by disclosing social and environmental information, including public health concerns (Carol, 1991; Chittoor et al., 2015; Khanna & Rivkin, 2001; Ramaswamy et al., 2017).

Moreover, legitimacy theory recommends carrying out CSR activities in response to environmental pressures related to social, political, and economic forces. Therefore, companies try to find a balance point in running their business with the wishes of the surrounding community (Deegan, 2002; Akhmad, 2004; Sarkar, 2010; Gomez-Mejia et al., 2011; Block & Wagner, 2014; Liu et al., 2017). Gray (2001) suggested that the theory of legitimacy is a condition or status, which exists when a company's value system is congruent with the value system of the larger social system in which the company is a part. When a potential difference exists between the two value systems, there will be a threat to the legitimacy of the company (Suyono & Farooque, 2018).

Therefore, CSR is a genuine effort by business entities to minimize negative impacts and maximize the positive impact of its operations on all stakeholders in the economic, social, and environmental sphere in order to achieve sustainable development goals (Block & Wagner, 2014; Liu et al., 2017). The different characteristics possessed by each company causes a different significance level of CSR disclosure in the annual report. A study conducted by Bansal et al (2018) found evidence that family ownership strengthened the role of independent directors to increase CSR disclosure.

Companies with family ownership constitute the majority in Indonesia (Suyono, 2018). Family businesses have an important role in the economy, both local and regional because they can provide permanent economic stability. Family ownership is non-diversified share ownership and is committed to generating strong incentives for certain families to monitor the company (Anderson et al, 2003). Furthermore, Anderson and Reeb (2003) explain that companies with family ownership do not just place their family members in the positions of CEO, commissioner or other management positions. This company is generally owned in the majority by certain families or the ownership of shares is concentrated in certain families.

According to Martinez et al. (2007) and Suyono (2016) companies that have a concentration of family ownership are believed to have a much better company performance than companies that are not based on family ownership. This is because companies controlled by families can professionalize their management and governance when they feel they are under market supervision and when they are accountable to minority shareholders.

Profitability assessment is the process of determining how well business activities are carried out to achieve strategic objectives, eliminating waste and presenting timely information to carry out the continuous improvement. There are several performance measurements of company profitability where each measurement is related to sales volume, total assets, and own capital. Overall these three measurements will allow an analyst to evaluate the level of earnings concerning the sales volume of a certain number of assets and investments of the company owner (Mafudi & Suyono, 2018).

Firm size is the size of the company as seen from the value of equity, the value of the company or the total assets (total assets) of a company. The greater the assets, the greater the capital invested, while the more sales there will be more money in the company. Thus, the size of the company is the scale of the size of assets owned by the company.

2.2. Hypotheses Development

2.2.1. Family Ownership and Corporate Concern for Public Health

The family business is a business that is owned and/or managed by several people who have a family relationship, both husband and wife and offspring, including kinship (Anderson et al., 2003; Suyono, 2018). Furthermore, Suyono (2018) revealed that most of the Indonesian listed companies are owned majority by the family of the founder of the company, and this founding family is involved in the company managerial.

From the stakeholders' perspective, CSR disclosure is the chosen tool to show the company's concern for the community's environment. According to Suyono & Farooque (2018) if the company has majority ownership of shares controlled by the family, then the company will be more supported in carrying out CSR disclosures. This is inseparable from the company that most of the shares owned by the family usually more often face the problem of information asymmetry. Thus, companies with large family ownership will be encouraged to disclose information voluntarily and widely.

Theoretically, Hirigoyen and Poulain-Rehm (2014) revealed a relationship between proactive stakeholder involvement and CSR of the family business. Disclosure of social responsibility for companies with family share ownership is an important factor that is seen as the need to form an identity and project a positive image and to preserve corporate heritage (Young et al., 2008). Therefore, family business owners consider company unrest or customer complaints as elements that can damage their business so they tend to have high involvement in CSR activities.

Empirically, a study conducted by Bansal et al. (2018) found evidence that family ownership strengthens the role of independent directors to increase CSR disclosure. Based on arguments above, the first hypothesis in this study can be formulated as follows:

H_1: Family ownership influences positively on corporate concern for public health

2.2.2. Profitability and Corporate Concern for Public Health

Profitability is the company's ability to manage assets owned to generate profits (Mafudi & Suyono, 2018). High profitability

shows good company performance, and with high profits, the company has enough funds to collect, classify and process information to be more useful and can present better disclosures. The legitimacy theory asserts that companies should seek legitimacy from stakeholders by revealing more about social activities and the environmental impact on profits obtained (Degaan, 2002; Agrawal & Sahasranamam, 2016). Therefore, profitable companies tend to try to show that the profits obtained are also allocated to carry out social activities and environmental preservation.

In addition, Freedman (1998) also shows that the higher the profit of a company, the higher the extent of CSR disclosure. This is because companies tend to try to show evidence that profits are followed by activities that restore environmental conditions or contribute to social responsibility.

Hermawan and Mulyawan (2014) stated that several previous studies have confirmed mixed results in explaining the relationship between profitability variables and CSR disclosure. Mafudi and Suyono (2018) find that profitability has a positive association with CSR. Similar findings were also obtained from the study of Wakid et al. (2013). Referring to the results of the research, the second hypothesis can be formulated as follows:

H_2: Profitability has a positive effect on corporate concern for public health

2.2.3. Firm Size and Corporate Concern for Public Health

The greater the size of income, total assets, number of employees and total capital, it will reflect the company's condition that is getting stronger. Wickert et al. (2016) explain that legitimacy theory has reasons for the relationship between CSR size and disclosure. Larger companies carry out more activities so that they have a greater influence on society, have more shareholders who are concerned about the social programs the company is doing and annual reports are an efficient tool for communicating this information. Large companies also tend to get a lot of pressure and have more operating activities to give greater influence to the community and have more shareholders who will always pay attention to the social programs made by the company so that disclosure of corporate social responsibility will be more widespread. Thus it can be said that company size is a predictor that significantly influences CSR disclosure.

Previous research conducted by Hermawan and Mulyawan (2014) found a positive relationship between company size and CSR disclosure. Furthermore, Dhiyaul-Haq and Santoso (2016) also prove that company size has a significant influence on disclosure of social responsibility. Nasution et al. (2018) found that company size was significantly related to CSR disclosure in public companies in Indonesia. Again, Nawaiseh et al. (2015) found a positive relationship between company size and CSR disclosure in Jordan.

Based on evaluations from some of the previous studies, the third hypothesis can be formulated as follows:

H_3: Company size has a positive effect on corporate concern for public health

3. Research Method

3.1. Sampling of The Study

This research is an empirical study on manufacturing companies listed on the Indonesia Stock Exchange (IDX) for 2014-2018 periods. The criteria for sample selection are as follows:

1) Manufacturing companies listed on the Indonesia Stock Exchange during the study period
2) Manufacturing companies that are not delisted from the Indonesia Stock Exchange during the study period
3) Manufacturing companies that have positive profits during the study period.
4) Manufacturing companies that have share ownership by the family group during the study period.

From 146 manufacturing companies listed on the Indonesia Stock Exchange, 32 companies are selected as a sample, so that for 5 years (2014-2018) 160 observations are obtained.

3.2. Measurement of Variables

3.2.1. Family Ownership

Family ownership is non-diversified share ownership and is committed to generating strong incentives for certain families to monitor the company (Anderson et al, 2003). The family ownership variable referred to in this study is the percentage of company stock ownership by a certain family from the total shares outstanding (Suyono & Farooque, 2018).

3.2.2. Profitability

The company's profitability in this study is measured by using the Return On Asset (ROA) ratio with the following formula (Mafudi & Suyono, 2018):

$$ROA = \frac{Net\ Income}{Total\ Assets} x\ 100\%$$

3.2.3. Firm Size

Firm size is measured by using Natural Logarithms (Ln) of total assets (Suyono & Farooque, 2018)

3.2.4. Corporate Concern for Public Health

The standard used to measure corporate concern for public health is the Global Reporting Initiative (GRI) index, particularly in public health-related indicators. This study selects the GRI standard in public health-related indicators only due to the previous studies used the general standards of GRI disclosure which consist of economic, social, and environmental indicators. In another word, to distinguish with the previous studies, this study selected the CSR disclosure in public health-related indicators which consist of GRI 303 (Water and Effluents with 5 reporting indicators), GRI 305 (Emission with 7 reporting indicators), GRI 306 (Effluents and waste with 5 reporting indicators), GRI 403 (Occupational health and safety with 10 reporting indicators), and GRI 416 (Customer health and safety with 2 reporting indicators). Therefore, this study concludes that there are 29 GRI public health related indicators (GRI, 2013). The formula for calculating the Corporate Concern on Public Health (CCPH) by using GRI for public health-related indicators is as follows (Suyono, 2011; GRI, 2013; Suyono & Farooque, 2018):

$$CCPH = \frac{\sum X}{N} x\ 100\%$$

Where:
CCPH : Corporate concern on public health
$\sum X$: Number of CSR disclosure in public health related indicators by each company (<29)
N : Total items based on GRI for public health related indicators (29).

3.3. Data Analysis

Before the *ordinary least square* (OLS) as main analysis, this study presents the test of descriptive statistics, correlation matric, and classical assumption of regression which consists of normality, multicollinearity, autocorrelation, and heteroscedasticity. Then, data analysis is done by using OLS with the following equation:

$$CCPH = \beta_0 + \beta_1 FAM + \beta_2 PROF + \beta_3 SIZE + \varepsilon \quad (1)$$

Where:
CCPH = corporate concern on public health
FAM = family ownership
PROF = profitability which is measured by Return on Assets (ROA)

SIZE = firm size
β_0 = a constant
$\beta_1 - \beta_3$ = Regression coefficients
ε = error

4. Findings and Discussion

4.1. Descriptive Statistics and Classical Assumption of Regression

Table 1 below shows the descriptive statistics of the variables in this study. The mean value of the dependent variable of corporate concern on public health (CCPH) is 0.3171 ranging from 0.14 to 0.48. Moreover, the mean values for family ownership (FAM), profitability (PROF), and firm size (SIZE) are 0.6365, 7.0149, and 14.4161 respectively.

	N	Min	Max	Mean	St. Dev
CCPH	160	0.14	0.48	0.3171	0.08599
FAM	160	0.14	0.96	0.6365	0.21399
PROF	160	0.08	26.15	7.0149	5.31656
SIZE	160	11.40	18.34	14.4161	1.66711

Table 1. Descriptive Statistics

Before the *ordinary least square* (OLS) as the main analysis, this study presents the test of descriptive statistics and classical assumption of regression which consists of normality, multicollinearity, autocorrelation, and heteroscedasticity.

The normality test in this study uses the Kolmogorov-Smirnov method. Residual values are said to be normally distributed if the significance value of Standardized Residuals > 0.05 (α). The normality test results show Asymp. Sig is 0.109 which is higher than 0.05 meaning that all data are distributed normally.

Multicollinearity test is done by looking at the value of Variance Factor Inflation (VIF) of each independent variable on the dependent variable. If the VIF value is less than 10 then the model is declared not to contain a multicollinearity problem. The results of multicollinearity testing of VIF values for the FAM, PROF, and SIZE variables are 1,003, 1,045, and 1,042 respectively which are lower than 10. It means that there is no multicollinearity problem in the model.

Heteroscedasticity test is a test that aims to test whether the regression model occurs variance invariance from residuals of one observation to another. Heteroscedasticity test results with Park Glejser show the significant value of FAM, PROF, and SIZE of 0.086, 0.390, and 0.353 respectively which are higher than 0.05. It means that there is no heteroscedasticity problem in the model.

The autocorrelation test in this study uses the Durbin-Watson test (DW test) where the DW value of 1,902 is a veranda between the dU (1,759) and 4-dU (2,241) values so that the research model is free from autocorrelation problems.

4.2. Results of OLS

Table 2 below presents the OLS regression results explaining the link between corporate concern on public health (CCPH) and family ownership (FAM), profitability (PROF), and Firm size (SIZE). Almost all independent variables have a significant influence on CCPH except for FAM.

PROF has positive significant explanatory power in determining CCPH at p 0.002 with a coefficient value of 0.004. Similarly, SIZE appears to have a significant positive effect on CCPH at p 0.000 with a coefficient value of 0.018. On the other side, FAM shows no significant effect on CCPH.

Based on the OLS result, the regression model is as follows:

$$CCOH = 0.002 + 0.052\ FAM + 0.004\ PROF + 0.018\ SIZE + \varepsilon$$

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.002	0.062		0.034	0.973
	FAM	0.052	0.032	0.128	1.627	0.106
	PROF	0.004	0.001	0.258	3.197	0.002
	SIZE	0.018	0.004	0.340	4.226	0.000
a. Dependent Variable: CCPH F: 12.319, Sig. 0.000 Adjusted R Square 0.211						

Table 2. Result of OLS

4.3. Discussion

The first hypothesis in this study states that family ownership has a positive effect on corporate concern for public health. The OLS results show that family ownership has no significant effect on CCPH disclosure, so the first hypothesis is not supported. Thus the findings in this study do not succeed in proving the concept of stakeholder theory which views that CCPH disclosure is the tool chosen to show the company's concern for the society's environmental issues such as public health. According to Ararat et al. (2018) in a company whose majority shares are owned by the family, the company will be more supportive of the implementation of CSR disclosures. The findings in this study also do not confirm the argument of legitimacy theory which indicates that to obtain legitimacy, companies with high family ownership will carry out more social and environmental activities including their concern on public health so that they influence internal and external parties who have an interest in the company.

The findings in this study are more in line with arguments in the theory of market efficiency (Fama, 1970) which states that the problems that occur in companies that are mostly owned by families are usually related to the problem of disclosure of information that is not done in full. Fama (1970) argues that if disclosure of the information is not carried out in full, it will cause information asymmetry. The asymmetry of information is interpreted by the existence of different perceptions between families who have shares in the company with the community. What companies do as CSR is often responded to not as CSR by the public. For example the case of CSR from PT. Indal Aluminum Industri Tbk in Indonesia, which directly industrial waste does not pollute the environment, so when the company is involved in handling the ecosystem will be considered by stakeholders as an obligation, not a concern.

Furthermore, Barnea and Rubin (2010) argued that companies with a percentage of family ownership would be interested in investing in CSR activities if it is believed they would get a lot of benefits from these activities. So companies with a family ownership structure are generally more or less motivated to disclose additional information on corporate social responsibility disclosure activities if they feel they will not benefit too much. As an example of a company's implementation, some of the company's social responsibility disclosure funds come from return earnings, which means that it will reduce dividend rights for investors. Shareholders who are also a family of management will certainly influence management to reduce CSR activities to obtain greater individual profit. The main objective of family shareholders according to Lahouel et al. (2014) is the continuity of their business and maintaining their reputation. Research conducted by Lahouel et al. (2014) shows that family ownership does not affect the disclosure of corporate social responsibility. Based on these explanations, the results of this study are also in line with the findings of a previous study conducted by Dhiyaul-Haq (2016) which also shows evidence that family ownership has no significant effect on disclosure of corporate social responsibility.

The second hypothesis of this study states that profitability has a positive effect on corporate concern for public health. The OLS results show that profitability has a significant influence on

CCPH disclosure meaning that the second hypothesis is supported. According to Wakid et al. (2013) and Mafudi and Suyono (2018) companies with a high level of profitability tend to disclose more CSR information including public health concern, because companies that have the ability to generate high profits, usually also have a lot of funds, including to make disclosures of social responsibility to reduce social pressure and negative views from the market.

The acceptance of the second hypothesis means that this research supports the theory of legitimacy which indicates that to obtain legitimacy, companies with high profitability seek to gain legitimacy from parties associated with the company to show evidence that the profits obtained are allocated to activities that support the surrounding environment. The results of this study are in line with the findings of a previous study conducted by Wakid et al. (2013) and Mafudi and Suyono (2018) which also shows evidence that profitability has a significant effect on disclosure of corporate social responsibility. On another side, it contradicts Nawaiseh et al. (2015) who found that ROE is positively related to CSR disclosure while ROA does not have a significant relationship. Likewise, firm size is not significantly related to CCPH disclosure. This finding is in line with the results of Wakid et al. (2013), in Indonesia. Moreover, the finding of this study is not inline with Hermawan and Mulyawan (2014) concluded that there is very little correlation between company performance and the quality of CSR disclosure in Indonesia.

The third hypothesis in this study states that firm size has a positive effect on corporate concern for public health. OLS results show that firm size has a significant influence on CCPH disclosure which means that the third hypothesis is supported. A company with a larger size makes it easier to get information on it so the company will disclose more extensive information, causing a greater level of CCPH disclosure. It supports previous studies, such as Hermawan and Mulyawan (2014), Dhiyaul-Haq and Santoso (2016) and Nawaiseh et al. (2015) which states that company size has a positive effect on CSR disclosure including public health concern. This research also supports the theory of legitimacy which indicates that larger companies will carry out more activities so that they have a greater influence on society. Companies with larger sizes also have more shareholders who have attention to the social programs undertaken. Therefore, the bigger the company the greater the level of CCPH disclosure.

5. Conclusion

This study aims to evaluate the influence of family ownership, profitability and firm size on corporate concern for public health. By using purposive samping method, this study ended up with 32 companies as a sample for 2014-2018 periods (i.e, 160 observations). The OLS results show that almost indepedents variables have a positive association with CCPH disclosure except for family firm. Based on the findings, It is recommended that companies with significant family ownership should incur additional costs devoted to CSR activities including public health related indicators to further enhance the company's reputation in front of all stakeholders.

References

[1] Aguinis, H., & Glavas, A. (2012). What we know and don't know about corporate social responsibility: A review and research agenda. *Journal of Management*, 38(4): 932-968.

[2] Agrawal, A., & Sahasranamam, S. (2016). Corporate social entrepreneurship in India. *South Asian Journal of Global Business Research*, 5(2), 214-233.

[3] Ararat, M., Colpan, A. M., & Matten, D. (2018). Business groups and corporate responsibility for the public good. *Journal of Business Ethics*, 153(4), 911-929.

[4] Arnold, D. G., & Valentin, A. (2013). Corporate social responsibility at the base of the pyramid. *Journal of Business Research*, 66(10), 1904-1914.

[5] Ahmad, N. (2004). Environment Disclosure in Malaysia Annual Reports: A Legitimacy Theory Perspective, *International Journal of Commerce and Management*, 14(1), 44-58.

[6] Anderson, R.C., Mansi, S.A., & Reeb, D.M. (2003). Founding Family Ownership and the Agency Cost of Debt, *Journal of Financial Economics*, (68), 263-285.

[7] Bansal, S., Lopez-Perez, M.V., & Rodriguez-Ariza, L. (2018). Board independence and corporate social responsibility disclosure: The mediating role of the presence of family ownership, *Journal of Administrative Science*, 8(3), 1-21.

[8] Barnea, A., & Rubin, A. (2010). Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics*, 9 (7), 71-86

[9] Block, J. H., & Wagner, M. (2014). The effect of family ownership on different dimensions of corporate social responsibility: Evidence from large US firms. *Business Strategy and the Environment*, 23(7), 475-492.

[10] Carroll, A. B. (1991). The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders. *Business Horizons*, 34(4), 39-48.

[11] Chittoor, R., Kale, P., & Puranam, P. (2015). Business groups in developing capital markets: Towards a complementarity perspective. *Strategic Management Journal*, 36(9), 1277-1296.

[12] Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosure – a theoritical foundation, *Accounting, Auditing, and Accountability*, Vol. 5, No. 3. 282-311.

[13] Dhiyaul-Haq, Z.M., & Santoso, A.L (2016). The effect of profitability, awards, and type of ownership of sharia commercial banks on disclosure of Islamic social reporting (a translation from the Indonesian language), *Proceeding of the National Symposium on Accounting (SNA)*, XIX, Lampung, Indonesia.

[14] Fama, E.F. (1970). Efficient capital market: A review of theory and empirical work. *Journal of Finance*, 25(2), 383-417.

[15] Fanti, L., & Buccella, D. (2018). Profitability of corporate social responsibility in network industries. *Int Rev Econ*, 65, 271-289.

[16] Global Reporting Initiative (GRI) (2013). *G4 Guidance for Sustainability Reporting*, 1001 EA Amsterdam, The Netherlands.

[17] Gomez-Mejia, L. R., Cruz, C., Berrone, P., & De Castro, J. (2011). The bind that ries: Socioemotional wealth preservation in family firms. *Academy of Management Annals*, 5(1): 653-707.

[18] Gray, R. (2001). Social and Environmental Disclosure and Corporate Characteristics: A Research Note and Extension, *Journal of Business Finance and Accounting*, 28, 327- 356.

[19] Hermawan, M.S., & Mulyawan, S.G. (2014). Profitability And Corporate Social Responsibility: An Analysis of Indonesia's Listed Company, *Asia Pacific Journal of Accounting and Finance*, 3(1), 15-31.

[20] Hirigoyen, G., & Poulain-Rehm, T. (2014). The Corporate Social Responsibility of Family Businesses: An International Approach, *International Journal of Financial Studies*, 2, 240-265.

[21] Ioannou, I., & Serafeim, G. (2012). What drives corporate social performance? The role of nation-level institutions. *Journal of International Business Studies*, 43(9), 834-864.

[22] Jamali, D., & Karam, C. (2018). Corporate social responsibility in developing countries as an emerging field of study. *International Journal of Management Reviews*, 20(1), 32-61.

[23] Jamali, D., Karam, C., Yin, J., & Soundararajan, V. (2017). CSR logics in developing countries: Translation, adaptation and stalled development. *Journal of World Business*, 52(3), 343-359.

[24] Khanna, T., & Rivkin, J.W. (2001). Estimating the performance effects of business groups in emerging markets. *Strategic Management Journal*, 22(1), 45-74.

[25] Lahouel, B. B., J. M. Peretti, and D. Autissier. (2014). Stakeholder power and corporate social performance. *Corporate Governance*, 14 (3), 363-381.

[26] Mafudi, M., & Suyono, E. (2180. Firm specific attributes and corporate social responsibility disclosure in manufacturing and mining companies: Evidence from Indonesia. *Journal of Economics & Management Perspective*, 12(4), 14-27.

[27] Martínez, J.I., Stohr, B.S., & Quiroga, B.F. (2007). Family ownership and firm performance: Evidence from public companies in Chile, *Family Business Review*, 20(2). 83-94.

[28] Liu, M., Shi, Y., Wilson, C., & Wu, Z. (2017). Does family involvement explain why corporate social responsibility affects earnings management? *Journal of Business Research*, 75, 8-16.
[29] Nasution, A.H., Erlina, & Tamizi, H.B. (2018). An analysis on the influence of profitability, firm size, liquidity, and leverage on the expression of firm's social responsibility in banking companies listed in BEI (Indonesian Stock Exchange). *International Journal of Research and Review*, 5 (9), 92-105.
[30] Nawaiseh, M.E., Also-boa, S.S., & El-shohnah, R.A.Z.Y. (2015). Influence of firm size and profitability on corporate social responsibility disclosures by banking firms (CSRD): Evidence from Jordan. *Journal of Applied Finance & Banking*, 5(6), 97-111.
[31] Ramaswamy, K., Purkayastha, S., & Petitt, B. S. (2017). How do institutional transitions impact the efficacy of related and unrelated diversification strategies used by business groups? *Journal of Business Research*, 72, 1-13.
[32] Sarkar, J. (2010). Business groups in India. In A. M. Colpan, T. Hikino, & J. R. Lincoln. (Eds.). *The Oxford handbook of business groups*. Oxford: Oxford University Press.
[33] Sharma, B. (2013). *Contextualising CSR in Asia: Corporate Social Responsibility in Asian economies*. Singapore: Lien Centre for Social Innovation.
[34] Shauki, E. 2011. Perceptions on corporate social responsibility: a study in capturing public confidence. *Corporate Social Responsibility and Environmental Management*, 18(3), 200-208.
[35] Suyono, E. (2011). The effect of external ownership sttructure and corporate social responsibility disclosure to firm financial performance and its implication to shareholders value. *Global Journal of Strategies & Governance*, 3(2), 46-55.
[36] Suyono, E. (2016). Family Controlled Firm, Governance Mechanisms and Corporate Performance: Evidence from Indonesia. J*urnal Ekonomi, Bisnis dan Akuntansi Ventura*, 19(1), 111-124.
[37] Suyono, E. (2018). Family involvement in firm's management and productivity: An empirical evidence from Indonesia. *Jurnal Keuangan dan Perbankan*, 22(2):256-275.
[38] Suyono, E., & Farooque, O. 2018. Do Governance Mechanisms Deter Earnings Management and Promote Corporate Social Responsibility? *Accounting Research Journal*, 31(3), 479-495.
[39] Waagstein, P. R. (2011). The mandatory corporate social responsibility in Indonesia: Problems and implications. *Journal of Business Ethics*, 98(3), 455-466.
[40] Wakid, N.L., Triyuwono, I., & Assih, P. (2013). The influence of company characteristics on corporate social responsibility disclosure of manufacturing companies listed on the Indonesia Stock Exchange (a translation from the Indonesian language). *Proceedings of the National Symposium on Accounting XV*, Malang, Indonesia.
[41] Wickert, C., Scherer, A. G., & Spence, L. J. (2016). Walking and talking corporate social responsibility: Implications of firm size and organizational cost. *Journal of Management Studies*, 53(7), 1169-1196.
[42] Young, M. N., Peng, M. W., Ahlstrom, D., Bruton, G. D., & Jiang, Y. (2008). Corporate governance in emerging economies: A review of the principal-principal perspective. *Journal of Management Studies*, 45(1). 196-220.

The Effect of Corporate Governance Mechanism on Financial Performance in Indonesia

Imang Dapit PAMUNGKAS[1*], Mochammad CHABACHIB[2], Dwi Ayu Ratna PUSPITASARI[3], Hersugondo HERSUGONDO[4]

[1]Universitas Dian Nuswantoro, Indonesia
[2,3,4]Universitas Diponegoro, Indonesia
[*]Corresponding author; E-mail: imangdapit.pamungkas@dsn.dinus.ac.id

Abstract

This study aims to analyze the effect of size of the board of commissioners, size of the board of directors, independent board of commissioners and institutional ownership on the determination of financial performance. This study uses secondary data collected from company annual reports and Bloomberg financial data. The data used in the form of financial statements of manufacturing companies from 2015-2018. From 167 manufacturing companies, with purposive sampling technique, so that the total sample was 235 observation. The data of this study were further analyzed using multiple linear regression analysis. Based on the results of hypothesis testing through the t test proves that the variable size of the board of directors and independent board of directors has a significant positive effect on financial performance. However, the board size variable is not significantly negative effect on financial performance and institutional ownership does not have a significant positive effect on financial performance.

Keywords: *financial performance; corporate governance mechanism; institutional ownership.*

1. Introduction

Financial performance determines the measures used as a benchmark for the company's success in generating profits. The higher the company's performance, the higher the company's performance in the eyes of investors. Optimal corporate financial performance is influenced by several factors. One of them is caused by the application of the principles of Good Corporate Governance (Andriana & Panggabean, 2017). Efforts to improve the company's financial performance are needed in an effective, efficient and economical Good Corporate Governance mechanism. Financial performance will be in a good condition if the company's activities are carried out continuously. As such, effective regulation and control mechanisms in company operations are needed as well as the ability to identify different stakeholders (Feliciana, 2017).

The importance of good corporate governance mechanism is recognized after various scandals and regulators of large companies in the world tighten regulations (Kandukuri, Memdani, & Raja Babu, 2015). Efforts to reduce conflict or agency problems require oversight mechanisms for managing company activities. Good corporate governance is a management of the company that includes the relationship between company management, the board, shareholders and other stakeholders (OCDE, 2016). Good corporate governance is used as a guide that provides guidelines and principles so that managers can take appropriate steps to harmonize the interests of managers and shareholders. Therefore, reducing agency conflict can increase the welfare and prosperity of shareholders (Hersugondo, Pertiwi, & Udin, 2019). Good corporate governance emerges from the interests of companies to ensure principals/investors that the funds invested are used appropriately and efficiently (Mahrani & Soewarno, 2018).

The mechanism used to create good corporate governance consists of internal and external mechanisms (Ujunwa, 2012). Internal corporate governance is divided into two groups, namely internal governance managers and internal owner-owners (Veno, 2015). Internal mechanisms consist of owners and internal stakeholders as managers of the company such as the board of commissioners, the board of directors, institutional ownership, managerial ownership and company size (Abobakr & Elgiziry, 2015). While external mechanisms include parties outside the company that have interests such as debt users from the company's leverage. The mechanism encourages company management, which may lead to a tendency to gain personal profit, rule-based decision making to achieve goals.

The board of commissioners is an organ in the company that plays an important role, especially in the implementation of corporate governance (Pamungkas, Ghozali, & Achmad, 2018). The board of commissioners has the duty to ensure the strategic implementation of the company, supervise the management of the company's operations, and ensure the implementation of accountability properly (Das, 2017). This shows that the board of commissioners is the core of the implementation of good corporate governance. Through the monitoring function of the implementation of good corporate governance at the discretion of the Board of Directors, it can minimize agency conflict between the Board of Directors and shareholders (Mutmainah, 2012). Independent Commissioner is a commissioner who does not have a relationship with shareholders either controlling shareholders or majority shareholders. The independent commissioner has the task to ensure that the supervisory activities carried out by the board of commissioners are carried out effectively and in accordance with applicable laws and regulations.

In addition to the internal mechanism of good corporate governance, there are also external mechanisms sourced from outside the company. One external mechanism is the structure of institutional ownership (Pamungkas, Ghozali, & Achmad,

2018). Institutional stock ownership comes from financial institutions such as legal entities, insurance institutions, trust funds, and government institutions. According to (KNKG, 2006) the Board of Directors is a corporate organ that has the duties and responsibilities to manage the company. In this case, the Board of Directors has the authority to set policies and implement them. The Board of Directors holds control in the company because it plays the role of being responsible for all policies the company will take.

The implementation of good corporate governance mechanism can create a system to direct, control, and supervise all resources owned by the company effectively and efficiently. Table 1 summarizes the research gap in research on financial performance. Based on various studies conducted previously according to table 1, there are differences in results or gaps in the relationship between the size of the board of commissioners, the size of the board of directors, the proportion of independent board of commissioners, institutional ownership. So, the purpose of this study was to analyze the effect of the size of the board of commissioners, the size of the board of directors on the frequency of independent boards of commissioners and institutional ownership on financial performance.

Relationship Between Variables		Result	Author
Dependent	Independent		
Financial Performance	Size of the Board of Commissioners	Significant Positive	Risnanditya (2018), Gray dan Nowland (2018), Aisyah (2017)
		Significant negative	Haji dan Mubaraq (2015), Kao et. al (2018)
		No effect	Yuniarti (2018), Zahra, et.al (2016), Veno (2015)
	Size of the Board of Directors	Significant Positive	Fernandez, et.al (2014), Veno (2015), Rahmawati dan Handayani (2017), Sihotang (2017)
		No effect	Widyati (2015), Mayangsari dan Andayani (2015)
	Independent Board of Commissioners	Significant Positive	Zahra, et.al (2016), Faatihah, et.al (2016), James dan Joseph (2015)
		Significant negative	Yin dan Gao (2011)
		No effect	Yuniarti (2014), Aisyah (2017) Rahmawati dan Handayani (2017), Yuniarti (2018), Risnanditya (2018)
	Institutional Ownership	Significant Positive	Widyati (2013), Aisyah (2017), Khan dan Nouman (2017), Kao et. al (2018)
		Significant negative	Zouri dan Taktak (2014), Haji dan Mubaraq (2015), Yuniarti (2018)
		No effect	Rahmawati dan Handayani (2017), Rashid (2018), Arora dan Sharma (2016)

Table 1. Previous Research Gap Research

1. Literature

The management of the company gives rise to the separation of ownership and control and responsibility among stakeholders which causes agency problems (Jensen & Meckling, 1976). Agency theory explains the relationship between aspects of human behavior consisting of owners of capital (principal) with managers (agents) who have their respective interests. One party maximizes personal interests by ignoring the principal's interests of the goals made by the company to maximize the interests of shareholders. Therefore, to overcome the agent's actions, a control is needed. Agency theory is closely related to the implementation of corporate governance, this makes corporate governance as an alternative to reducing agency costs incurred by the principal. Through corporate governance gives confidence that investors receive returns on funds that have been invested.

Performance illustrates the achievements that have been generated by the company over the implementation of operational activities so it is known whether good or bad the company's financial condition. The company's performance shows the level of effectiveness and efficiency of the company managing management in achieving the goals set (Isgiyarta, Nugroho, Ratmono, Helmina, & Pamungkas, 2019). There are measures used as benchmarks in measuring financial performance. A measure often used is a ratio that compares two financial data. Financial ratio analysis compares two things: the ratio of the past, present and future in the same company. It also can make comparisons between one company with other similar companies.

Financial performance assessment is a determinant for a company's success in managing its resources, the assessment is carried out using financial ratio analysis contained in the financial statements as the basis for its calculation (Goldwin & Christiawan, 2017). Ratios used to measure a company's financial performance include profitability ratios, liquidity ratios, solvency ratios and activity ratios.

2.1. Size of the Board of Commissioners on Financial Performance

Based on agency theory explained that between the owner and the manager has different interests. This difference in interests can lead to conflict between the two parties. The board of commissioners has the duty to supervise and provide input to the board of directors in carrying out their duties in the company (Anggilia, Puspita, & Rinaldo, 2015). The board of commissioners is part of the company that does not have direct authority with the company. As such, the board of commissioners has an important role as an intermediary between the differences in principal interests in the company. The number of the board of commissioners influences the company's performance. The greater the number of boards of commissioners, the worse the company's performance. This is due to the large number of board of commissioners causing the performance of the board of commissioners themselves to be disrupted, as communication becomes ineffective and coordination of tasks becomes more difficult (Ahmed Haji & Mubaraq, 2015; Dewi, Susanti, Magdalena, Zulvia, & Fernos, 2018; Lloréns & Pedro, 2019).

Different research conducted by Bansal & Sharma, (2016); Supriatna & M. Kusuma, (2009) showed that the size of the board of commissioners had a positive influence on financial performance. That is because the large number of boards of commissioners can provide much better input to directors in relation to their duties in corporate policy making. Differences in the results of these studies will require further research to prove the effect of the size of the board of commissioners on financial performance.

H1: The size of the Board of Commissioners has a positive relationship on financial performance

2.2. Size of the Board of Directors on Financial Performance

Based on the agency theory of Jensen & Meckling, (1976), there is a separation between control and management, the separation in management and ownership functions is carried out by different parties. Shareholders whose job is to carry out control and supervision over the separation of management and management. The board of directors has a function as a supervisor for the duties of managers in the company. Therefore, the board of directors is a corporate organ that has an important role. The supervisory function performed by the board of directors can minimize agency conflicts and opportunistic actions that may be carried out by shareholders or managers. Based on the provisions of Law No.1 of 1995 concerning limited liability companies, each company must have at least two boards of commissioners. Thus, the number of boards of di-

rectors in a company will affect the agency costs and financial performance. Based on agency theory, the more the number of boards of directors, the more advice on company policies and resources will be expected so that decisions taken can be more optimal than if the number of boards of directors is small (Hidayah & Rahmawati, 2019; Veno, 2015).

H2: Board of Directors size has a positive effect on financial performance

2.3. Independent Commissioners on Financial Performance

Based on agency theory the emergence of asymmetric information is caused by opportunistic actions on the part of management. The existence of an independent board of commissioners aims to monitor and control these opportunistic actions (Jensen & Meckling, 1976). The independent board of commissioners as a party that is not affiliated with the board of directors, commissioners or shareholders is expected to be an intermediary from conflicts between stakeholders. Therefore, the existence of an independent board of commissioners causes the management of the company to be more effective so that the company's performance increases (Suhardjanto, Aprilyana, & Setiany, 2018; Tulung & Ramdani, 2018).

H3: Independent Commissioners have a positive influence on Financial Performance

2.4. Institutional Ownership of Financial Performance

Agency problems arise due to information asymmetry between the principal and the agent. One form of information asymmetry is moral hazard, managers prioritizing their own interests at the expense of shareholders. The existence of moral hazard can be a barrier to management. The high number of institutional ownership influences the company's performance monitoring system which is more effective (Chabachib, Yudha, Hersugondo, Pamungkas, & Udin, 2019; Pamungkas, Ghozali, Achmad, Khaddafi, & Hidayah, 2018). This can reduce the possibility of managers and shareholders taking actions that prioritize the interests of each party. The involvement of institutions in these companies increases financial performance for the better. This shows the existence of a positive relationship between the ownership of institutions to financial performance. The results of these studies are consistent with the results of research conducted by Jensen & Meckling, (1976) However, research that states that the involvement of institutions in companies has the opposite effect on financial performance (Hidayah & Rahmawati, 2019; Sari & Patrisia, 2019).

H4: Institutional Ownership has a positive influence on Financial Performance

Based on the description above, it can provide an overview related to the theoretical thinking of the research to be tested, shown in Figure 1.

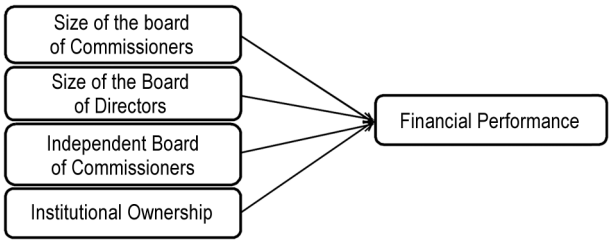


Figure 1. Theoretical framework

3. Research Method

3.1. Sample and Data Collection

The population in this study is manufacturing companies listed on the Indonesia Stock Exchange in 2015-2018. Manufacturing companies were chosen as objects in this study because the manufacturing sector has a potential role in the development of the Indonesian economy and the manufacturing sector has an attraction for investors to invest. The data used in this study are secondary data. which comes from the Annual report and the financial statements of manufacturing companies in 2015-2018. Annual reports and financial reports are obtained from Bloomberg, Faculty of Economics and Business, Diponegoro University and the website www.idx.co.id. The following are the sampling criteria using the purposive sampling method:

No.	Information	Total
1.	Publicly listed manufacturing companies listed on the Indonesia Stock Exchange	167
2.	Manufacturing companies that do not publish financial reports and annual reports in a row during 2015-2018	(39)
3.	Manufacturing companies that do not have complete data for measurements	(31)
4.	Companies that qualify as a sample	97
5.	Number of observation points during 2015-2018	388
6.	Data Outlier	(153)
	Total observational data for 2015-2018	235

Table 2. Research Samples

Table 3. Variable Operational Definitions

Source: Various Research Journals

Variable	Definition	Measurement
Financial Performance	The company's financial ratios related to profit potential measure the strength of the company to produce profits or profits at the level of income, assets and also share capital	Profit before tax / Total Assets × 100%
Size of the board of commissioners	Number of board members in the company	∑ The size of the board of commissioners
Size of the board of directors	Number of board members in the company	∑ Size of the board of directors
Independent board of commissioners	Members of the board of commissioners who are not affiliated with other members of the board of directors, board of directors or controlling shareholders, and are free from business relations	Number of Independent Commissioners / Total Board of Commissioners × 100%
Institutional Ownership	Number of shares owned by the institution	Number of shares owned by the Institution/ Number of shares outstanding × 100%

3.2. Analysis Method

Data analysis in this study used multiple regression to test hypotheses. Next, do a descriptive statistical test to provide an overview of the data that has been collected and then analyzed. Description of the data seen from the mean, standard deviation, maximum variance, minimum, sum, range kurtosis, and skewness. Hypothesis testing uses multiple linear regression analysis. Multiple linear analysis was performed by the coefficient of determination test (R2), the simultaneous regression coefficient test (F test), and the test for the significance of Individual parameters (t test).

3.3. Result and Discussion

In multiple regression analysis, the data must meet several requirements such as normally distributed data, multicollinearity, autocorrelation, and heteroscedasticity. It aims to get an unbiased regression model. Based on the results obtained from the classical assumption test, it can be concluded that the model

used in this study has fulfilled the requirements for multiple regression analysis. Multiple regression analysis aims to determine the relationship of independent variables to the dependent variable.

Variable	N	Minimum	Maximum	Mean	Std. Deviation
ROA	235	-36,79	55.25	4.2529	10.25598
DD	235	2	16	5.19	2.341
DK	235	2	13	4.31	1.787
PDKI	235	.00	1.00	.4055	.1929
IO	235	.00	52.45	38.1420	41.3980
LEV	235	.00	113.77	25.5214	21.46806
Valid N (listwise)	235				

Table 4. Descriptive Statistics of Research Variables
Source: Data processed, 2019

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.766	1.859		-3.102	.002
	DK	-.067	.195	-.024	-.342	.732
	Log_DD	9.890	2.238	.310	4.420	.000
	PDKI	11.788	3.144	.225	3.749	.000
	Log_IOWN	.493	.417	.070	1.182	.238

a. Dependent Variable: ROA

Table 5. Test Results t
Source: Secondary data processed, 2019

Based on these results multiple linear regression equations can be formed as follows:

ROA = -5.766 - 0.067 DK + 9.890 LogDD + 11.788 PDKI + 0.493 LogIOWN

This study has four hypotheses that are used to examine the factors that affect financial performance in manufacturing companies listed on the Indonesia Stock Exchange. Hypothesis 1 test results show the coefficient for the size of the board of commissioners of -0.342 with a significance of 0.732 (p> 0.05). It was concluded that the size of the board of commissioners variable had no significant negative effect on financial performance, so H1 was rejected. These results mean an increase in the size of the board of commissioners does not have an effect on improving financial performance. Agency Theory explains that company management must be monitored and controlled to ensure that company management is carried out in accordance with applicable rules and regulations. If the management of the company is not supervised properly, it can cause agency problems between the principal and the agent. The supervisory function in managing the company is carried out by the board of commissioners. However, the question is how many commissioners are ideal for producing good supervision so that it can affect financial performance. According to Yermack, (1996) the greater the number of boards of commissioners, it can cause financial performance to be worse. This is because the large number of board of commissioners will cause difficulties in terms of communication and coordination of work. Including difficulties in monitoring and controlling company management (Supriatna & M. Kusuma, 2009; Veno, 2015) who found an insignificant negative relationship between the size of the board of commissioners and financial performance.

Hypothesis 2 test results show the coefficient for the board size variable is 4.420 with a significance level of 0.000 (p <0.05). It was concluded that the size of the board of directors had a positive effect on financial performance, so H2 was **accepted**. There is a dependent resource view which means the company relies on the board to better manage the company's resources. Therefore, the number of boards of directors is very influential. The greater the number of the board of directors, the more expertise and expertise in a job, and each member understands well the tasks they have. This makes decision making for policies and strategies short-term and long-term better so that managers become more careful in acting. The manager's prudence has an impact on the reduction in agency problems which then affects the decreasing level of agency cost. A low level of agency cost can improve a company's financial performance (Hidayah & Rahmawati, 2019; Johl, Kaur, & Cooper, 2015; Veno, 2015) who found a significant positive relationship between the size of the board of directors on financial performance.

Hypothesis 3 test results showed the coefficient value for the variable proportion of the independent board of commissioners was 3.749 with a significance level of 0,000 (p> 0.05). It was concluded that the proportion of independent commissioners had a significant effect on financial performance, so H3 was **accepted**. These results mean an increase in the proportion of independent commissioners has an influence on improving financial performance. Agency Theory explains that an independent board of commissioners is an important party that can overcome agency problems in the company (Tulung & Ramdani, 2018). According to the Stewardship Theory perspective an independent board of commissioners can access broad information from the internal company so that companies with a relatively higher number of commissioners have more information. Varied information between boards about financial performance can improve financial performance. The description is supported by research conducted by Fuzi, Halim, & Julizaerma, (2016); Supriatna & M. Kusuma, (2009); Taufik, Widyastuti, & Yam, (2017) who found the proportion of independent commissioners to influence financial performance.

Hypothesis 4 test results show the coefficient for institutional ownership of 1.182 with a significance of 0.238 (p <0.05). It was concluded that institutional ownership had no positive effect on financial performance, so H4 was **rejected**. These results mean that the increase in the proportion of institutional ownership does not have an effect on improving financial performance. Jensen & Meckling, (1976) in their theory agency theory explains that institutional ownership is a tool to minimize agency problems. This is in accordance with the function of institutional ownership which plays an important role as a supervisor of management. However, high institutional ownership does not guarantee oversight of manager performance is carried out to the fullest. This is because, the occurrence of information asymmetry in the company causes managers and shareholders to act in their own interests, thereby ignoring the increase in financial performance. According to Hidayah & Rahmawati, (2019) high institutional ownership will have an impact on high risk, the level of losses owned by shareholders will be higher. This is consistent with research conducted by Arora & Sharma, (2016); Hidayah & Rahmawati, (2019); Rashid, (2018) who found an insignificant negative relationship between institutional ownership on financial performance. Based on the description above is presented a summary of the results of testing the hypotheses of each variable as follows:

Hypothesis	Hypothesis Testing Results	Conclusion
The size of the board of commissioners has a positive effect on financial performance	Negative is not significant	Rejected
The size of the board of directors has a positive effect on financial performance	Positive significant	Accepted
The proportion of independent commissioners has a positive effect on financial performance	Negative is not significant	Accepted
Institutional ownership has a positive effect on financial performance	Positive significant	Rejected

Table 6. Hypothesis Testing Results

4. Conclusion

Based on the results of data analysis and discussion, the conclusion of this study is that the size of the board of commissioners has no significant negative effect on financial performance. The size of the board of directors has a significant positive effect on financial performance. The proportion of the size of the board of commissioners has no significant negative

effect on financial performance. Institutional ownership has a significant positive effect on financial performance. The results showed that constitutional ownership had a significant positive effect on financial performance. This means that increasing the value of institutional ownership will increase financial performance. Conversely, a decrease in institutional ownership will reduce financial performance. That way investors can properly monitor the investments they invest in the companies concerned. So if institutional investors want to invest in a company, it is expected to choose a company that has high institutional share ownership to ensure the development of shares that are invested. The size of the board of commissioners and the proportion of independent board of commissioners have a negative and not significant effect on the financial performance of manufacturing companies. The board of commissioners and the board of independent commissioners who have great responsibility for the oversight activities of the management of the company management. It is hoped that they can work better and increase supervision of management. In addition, the management to be more transparent about the information needed by the independent board of commissioners so that agency problems in the company can be minimized, which in turn can improve financial performance.

Limitations Research only uses objects in the manufacturing industry sector, so the results of this study cannot yet be generalized to other sectors of companies in Indonesia or internationally. Future studies are expected to add to the sample in non-financial sector companies other than manufacturing companies. This aims to determine the effect of other industrial sectors on financial performance in order to complement the shortcomings in this study. Suggestions for further research Regarding research on the topic of corporate governance on financial performance, there are still variables that have not been used in this study. Future research is expected to be able to add the variables of board meetings, audit committee meetings, and managerial ownership which are still rarely examined.

References

[1] Abobakr, M. G., & Elgiziry, K. (2015). The Effects of Board Characteristics and Ownership Structure on the Corporate Financial Leverage. *Accounting and Finance Research*, 5(1), 1-14. https://doi.org/10.5430/afr.v5n1p1

[2] Ahmed Haji, A., & Mubaraq, S. (2015). The implications of the revised code of corporate governance on firm performance: A longitudinal examination of Malaysian listed companies. *Journal of Accounting in Emerging Economies*, 5(3), 350-380.

[3] Andriana, A., & Panggabean, R. R. (2017). The Effect of Good Corporate Governance and Environmental Performance on Financial Performance of the Proper Listed Company on Indonesia Stock Exchange. *Binus Business Review*, 8(1), 1. https://doi.org/10.21512/bbr.v8i1.1757

[4] Anggilia, V., Puspita, & Rinaldo, D. (2015). The Independent Commissioner As A Good Corporate Governance Mechanism To Increase Corporate Performance. *Atlantis Press*, (1972), 189-193.

[5] Arora, A., & Sharma, C. (2016). Corporate governance and firm performance in developing countries: evidence from India. *Corporate Governance* (Bingley), 16(2), 420-436. https://doi.org/10.1108/CG-01-2016-0018

[6] Bansal, N., & Sharma, A. K. (2016). Audit Committee, Corporate Governance and Firm Performance: Empirical Evidence from India. *International Journal of Economics and Finance*, 8(3), 103. https://doi.org/10.5539/ijef.v8n3p103

[7] Chabachib, M., Yudha, A., Hersugondo, H., Pamungkas, I. D., & Udin, U. (2019). The role of firm size on bank liquidity and performance: A comparative study of domestic and foreign banks in Indonesia. *International Journal of Economics and Business Administration*, 7(3), 96-105.

[8] Das, S. K. (2017). Impact of Corporate Governance Mechanisms on Firm's Performance: A Study on Listed Conventional Banks. *Asian Business Review*, 7(1), 15-24. https://doi.org/10.18034/abr.v7i1.6

[9] Dewi, A. S., Susanti, F., Magdalena, M., Zulvia, D., & Fernos, J. (2018). *The Effect of Auditing Quality and Independent Board of Commissioners on Financial Performance of Property and Real Estate Companies in Indonesia*. 57(Piceeba), 123-132. https://doi.org/10.2991/piceeba-18.2018.39

[10] Feliciana, A. (2017). Pengaruh Corporate Governance Terhadap Financial Performance Dengan Earning Management Sebagai Variabel Intervening Pada Perusahaan Yang Terdaftar Di LQ45. *Business Accounting Review*, 5(2), 13-25.

[11] Fuzi, S. F. S., Halim, S. A. A., & Julizaerma, M. K. (2016). Board Independence and Firm Performance. *Procedia Economics and Finance*, 37(16), 460-465. https://doi.org/10.1016/s2212-5671(16)30152-6

[12] Goldwin, J., & Christiawan, Y. J. (2017). Pengaruh penerapan corporate governance terhadap kinerja keuangan perusahaan dengan ukuran perusahaan dan umur perusahaan sebagai variabel kontrol. *Business Accounting Review*, 5(2), 217-228.

[13] Hersugondo, H., Pertiwi, S. N. A., & Udin, U. (2019). Corporate Social Responsibility and Corporate Value: Evidence from an Emerging Economy, Indonesia. *Quality-Access to Success*, 20(172), 51-55.

[14] Hidayah, N. E. F., & Rahmawati, R. (2019). The Effect of Capital Structure, Profitability, Institutional Ownership, and Liquidity on Firm Value. *Indonesian Journal of Contemporary Management Research*, 1(1), 55-64.

[15] Isgiyarta, J., Nugroho, D. A., Ratmono, D., Helmina, M. R. A., & Pamungkas, I. D. (2019). Budgetary participation on managerial performance: commitment organization, innovation perception, and job relevant information as mediating variable. *Quality-Access to Success*, 20(173), 48-53.

[16] Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial. *Journal of Financial Economics*, 3, 305-360. https://doi.org/http://dx.doi.org/10.1016/0304-405X(76)90026-X

[17] Johl, S. K., Kaur, S., & Cooper, B. J. (2015). Board Characteristics and Firm Performance: Evidence from Malaysian Public Listed Firms. *Journal of Economics, Business and Management*, 3(2), 239-243. https://doi.org/10.7763/joebm.2015.v3.187

[18] Kandukuri, R. L., Memdani, L., & Raja Babu, P. (2015). Effect of Corporate Governance on Firm Performance – A Study of Selected Indian Listed Companies. In *Overlaps of Private Sector with Public Sector around the Globe* (pp. 47-64). Emerald Group Publishing Limited.

[19] KNKG, K. N. (2006). *Pedoman Umum Corporate Governance di Indonesia*.

[20] Lloréns, M. B., & Pedro, J. (2019). Chapter 4. A profitability approach to Spanish banks' performance. *The Origins of Modern Banking in Spain. The Role of Monetary Plurality*, 1, 93.

[21] Mahrani, M., & Soewarno, N. (2018). The effect of good corporate governance mechanism and corporate social responsibility on financial performance with earnings management as mediating variable. *Asian Journal of Accounting Research*, 3(1), 41-60. https://doi.org/10.1108/ajar-06-2018-0008

[22] Mutmainah, W. (2012). Pengaruh Penetapan Corporate Governance terhadap Kinerja Keuangan pada Perusahaan Perbankan yang terdaftar di Bursa Efek Indonesia. *Diponegoro Journal of Accounting*, 1(2).

[23] OCDE, O. (2016). *International Migration Outlook 2016*. OECD publishing.

[24] Pamungkas, I. D., Ghozali, I., & Achmad, T. (2018). A pilot study of corporate governance and accounting fraud: The fraud diamond model. *Journal of Business and Retail Management Research*, 12(2).

[25] Pamungkas, I. D., Ghozali, I., Achmad, T., Khaddafi, M., & Hidayah, R. (2018). Corporate governance mechanisms in preventing accounting fraud: A study of fraud pentagon model. *Journal of Applied Economic Sciences*, 13(2).

[26] Rashid, A. (2018). Board independence and firm performance: Evidence from Bangladesh. *Future Business Journal*, 4(1), 34-49.

[27] Sari, R. M., & Patrisia, D. (2019). *The Effect of Institutional Ownership, Capital Structure, Dividend Policy, and Company's Growth on Firm Value. Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA 2019)*, 97(Piceeba), 637-645.

[28] Suhardjanto, D., Aprilyana, W. T., & Setiany, E. (2018). *Corporate Governance and Financial Performance a Comparative Study of Developing and Developed Markets*. 7(2), 1-179. Retrieved from http://prr.hec.gov.pk/jspui/bitstream/123456789/2819/1/306S.pdf
[29] Supriatna, N., & M. Kusuma, A. (2009). Pengaruh Good Corporate Governance Terhadap Kinerja Perusahaan. *Jurnal ASET (Akuntansi Riset)*, 1(1), 1. https://doi.org/10.17509/jaset.v1i1.8907
[30] Taufik, R., Widyastuti, T., & Yam, J. H. (2017). Impact of Good Corporate Governance, Intellectual Capital and Firm Policy on Firm Performance and Firm Value of Indonesian Commercial Banking (Empirical study on Indonesian Commercial Banks listed in Indonesian Stock Exchange (IDX) on 2010–2015). *International Journal of Advanced Scientific Research & Development (IJASRD)*, 4(3), 11-30.
[31] Tulung, J. E., & Ramdani, D. (2018). Independence, size and performance of the board: An emerging market research. *Corporate Ownership and Control*, 15(2), 201-208. https://doi.org/10.22495/cocv15i2c1p6
[32] Ujunwa, A. (2012). Board characteristics and the financial performance of Nigerian quoted firms. Corporate Governance: *The International Journal of Business in Society*, 12(5), 656-674.
[33] Veno, A. (2015). Pengaruh Good Corporate Governance terhadap Kinerja Perusahaan pada Perusahaan Manufaktur Go Public (Studi Empiris pada Perusahaan yang Terdaftar di BEI 2011-2013). *BENEFIT Jurnal Manajemen Dan Bisnis*, 19, 95-112.
[34] Yermack, D. (1996). Higher Market Valuation for Firms With a Small Board of Directors. *Journal of Financial Economics*, 40(40), 185-211.

Selected Aspects of Organizational Performance Management and Business Sustainability Strategy in the European Area

Jaroslava HEČKOVÁ [1], Matúš KUBÁK [2], Stela MARKOVÁ [3*], Alexandra CHAPČÁKOVÁ [4], Nella SVETOZAROVOVÁ [5], Dagmara RATNAYAKE KAŠČÁKOVÁ [6]

[1]Associate Professor, University of Prešov, Faculty of Management, Department of Economics and Economy, Prešov, Slovakia; E-mail: jaroslava.heckova@unipo.sk
[2]Assistant Professor, University of Prešov, Faculty of Management, Department of Economics and Economy, Prešov, Slovakia; E-mail: matus.kubak@unipo.sk
[3]PhD. student, University of Prešov, Faculty of Management, Department of Economics and Economy, Prešov, Slovakia; E-mail: stela.markova.smail@unipo.sk
[4]Associate Professor, University of Prešov, Faculty of Management, Department of Economics and Economy, Prešov, Slovakia; E-mail: alexandra.chapcakova@unipo.sk
[5]Assistant Professor, University of Prešov, Faculty of Management, Department of Management, Prešov, Slovakia; E-mail: nella.svetozarovova@unipo.sk
[6]Assistant Professor, University of Prešov, Faculty of Management, Department of Intercultural Communication, Prešov, Slovakia; E-mail: dagmara.ratnayake-kascakova@unipo.sk
[*]Corresponding author

Abstract

The active relationship between effective performance management and business sustainability acknowledges its increasing justification in both nationally and internationally. Finding out to what extent an organization is successful and its processes are systematic and adequately chosen requires a comprehensive assessment of the status of its performance and competitiveness. The concept is an important input that helps in the development of the organization as a whole and represents progress in the whole vertical of its management. As it is difficult for businesses to respond to a wide variety of incentives in the current dynamic era, they are often forced to make strategic decisions having a polarizing effect on their future direction. This paper offers an in-depth analysis of organizational performance management issues in relation to realizing business sustainability, precisely through the evaluation of a specific indicator such as competitiveness for the researchers operating in the manufacturing and service sectors under European area conditions over the reporting period.

Keywords: *organizational performance; sustainability strategy; competitiveness; cross-border mergers and acquisitions.*

1. A theoretical background – Relationship between performance management and business sustainability – a challenge of 21st century

The performance of organizations is now becoming an increasingly hot topic, since it integrates all areas of business activities that needs to be combined to get a functioning and a prosperous company with a long perspective. Performance evaluation is one element of the performance management process which involves different measurements throughout the organizations but it is the element which is important if an organization is to take advantage of their most important asset competitive advantage (Turgut, Mert, 2014). New modern concepts of performance evaluation in organizations have, paradoxically, their origins in the traditional system. However, the new concepts are based on the assumption that a company is efficient when it can achieve pre-defined strategic objectives. Choosing suitable evaluation methods means to determine the procedures for working with the criteria as well as the conditions under which they are to be used (Otley, 1999).The choice of effective and optimal measurement and performance management tools is often difficult and complex task that fully depends on the nature and objectives of the organization itself (Melnyk, 2005).

Therefore, the literature states and describes a variety of evaluation methods, some of which are still divided into different variants (Sojka, Svetozarovová, 2016). In other words, an attempt to find an optimal evaluation concept has led to the development of a plethora of different methods that can be used to evaluate the performance of an organizational actives. The relevant literature provides two most common and popular groups according to the complexity of the evaluation criteria (Turgut, Mert, 2014):

- absolute standard methods;
- relative standard methods.

Paauwe and Boiselie (2005, In: Guest, 2011) also point to the variability of organizational performance metrics. A wide range of indicators are used to identify the organizational performance of a company. In general, they can be divided into two basic groups, the classic, also called traditional indicators, divided into absolute and relative indicators and modern indicators. However, organizational performance can also be defined in the form of related outcomes such as turnover, commitment to the organization, job satisfaction, but also through the above-

mentioned traditional indicators such as profitability or through organizational market indicators such as quality, efficiency or capital ratios such as share price, market share, etc. The authors further suggest that organizational performance should definitely be evaluated as a multi-dimensional construct.

Patterson et al. (1997) identified key areas of management that were traditionally considered to affect organizational performance: corporate strategy, emphasis on quality, use of advanced manufacturing technology, and investment in research and development. However, the results of their research have shown that it is precisely human resource management practices that have a significant impact on performance.

From the perspective of organizational performance evaluation, there are a number of studies and research that can be categorized into two different perspectives (Titman et al., 1988; Rajan and Zingales, 1995; Mařík, 2005; Pavelková, 2005; In: Gavurová, 2010; Takim, Akintoye, 2002; Šmída, 2007):

- ❑ the financial perspective of organizational performance evaluation;
- ❑ systemic perspective of organizational performance evaluation.

Mavrinac, et al., (1995) suggested three categories of organizational performance. These are: workplace results, customer results (satisfaction) and financial performance (activity). Carnall (In: Tyson, Jackson, 1997, p. 194) uses a simple scheme to assess the success of organizations, showing performance and effectiveness on one axis, second qualitative and quantitative indicators. In the set of quantitative indicators he defined the set – profit, cost, use of resources, market share, quality of service, complaints and claims and flexibility. He states in the group of qualitative indicators – satisfaction, engagement, competitiveness, adaptation, corporate culture and management development. Carnall is convinced that the qualitative part of the analysis is considerably more laborious than quantitative, whose criteria can be easily determined by analyzing business documents. Equally demanding and long-term will be the subsequent effort to improve those qualitative criteria for which the analysis identifies the need for change.

Similarly, Dyer, Reeves (1995) analyze the issue of organizational performance indicators based on a comprehensive assessment (Folser 1978; In: Dyer, Reeves, 1995) and four specific dimensions are defined:

1. Work performance and individual performance – labor productivity, refers to employee behavior. This includes turnover, employee absenteeism and employee satisfaction;
2. Organization-wide performance – indicators can be the quality of provided products, products and services, the performance of management processes, customer satisfaction, competitiveness, etc.;
3. Financial performance – expressed by economic efficiency indicators such as liquidity, profitability, return, etc.;
4. Performance and turnover of shares on the market - consists of indicators such as the value of shares on the market, market price, rate of increase/decrease in price, market turnover.

Increasing the efficiency of management and performance evaluation generally takes into account the integration of soft approaches, where financial indicators of organizational performance are complemented by non-financial indicators (Varcholová et al., 2007). This trend has been developing for more than two decades, but their process of improvement is continuous.

This is also followed by a study by Ittner, Lacker (2003), which point to increased business interest in using non-financial indicators of organizational performance evaluation. In particular, they see the success of the implementation of non-financial indicators in the increased use of sophisticated quantitative and qualitative methods and less use of general performance measurements and management estimates.

Research on a process approach to performance measurement (Kueng, 2000) speaks of a set of five integrated key dimensions, an expanded basic concept of the Balanced ScoreCard. Garengo et al., (2005) conducted a comprehensive research study aimed at comparing the impact of factors, characteristic of specific generic performance evaluation models on overall organizational performance. The organizational performance evaluation models developed since 1980 have been compared. Traditional models, such as cost-based activities by Bourne (2000) was defined as a model based on accounting systems and financial information, but was not included in this comparison, as many research studies highlight the lack of these models for current management needs. The models were compared using eight dimensions, namely (strategy alignment, development strategy, stakeholder focus, balance, process orientation, depth, breadth, dynamic adaptability, causal relationships, clarity and simplicity). Also, the methods were compared according to three typologies defined by De Toni, Tonchia (2001) as vertical, balanced and horizontal typologies. As reported by Garengo et al. (2005), when comparing the development of these models over time, there has been a progressive change from a bureaucratic vertical system to a horizontal system.

Vertical architectures are defined as models that are strictly hierarchical, characterized in that costs are associated with performance at different levels of the organization (Berliner, Brimson, 1988; Lockamy, Cox, 1994; Rangone, 1996), the first hierarchical model described by Gold (1955, In: Garengo, 2005), which combines performance and return on investment. The author further states that horizontal architectures are value-chain-oriented models that take into account internal relationships with customers or suppliers (Moseng and Bredrup, 1993; Drez, Tuttle, 1989; In: Garengo, 2005).

It is indisputable that the issue of performance measurement is a very wide area, thus limiting the criterion is the choice and theoretical description of the most well-known models, which have also been studied by Garengo et al. (2005).

In general, however, it can be stated that in the case of evaluating the whole organizational performance, the financial dimension and its indicators are highly relevant, which also confirms the fact that for companies in general the primary problem in business sustainability is the issue of cost or financial and economic efficiency (Svetozarovova, 2016). In a traditional corporate culture, social and environmental objectives do not coincide with financial objectives. Therefore, despite the recognition of the general importance and necessity of a sustainable approach, its added value for the business that is being discussed. It is this fact that is identified as the biggest negative realization of sustainability for the company. However, many authors disagree with this idea as they see several substantial benefits that will ultimately translate into improved organizational outcomes (Maciková, Markovič, 2017; Gallo et al., 2019b).

Many studies show the positive effects of realizing a sustainable business for the company. Increasingly, the merits of integrating sustainability in business to create unique added value and business competitiveness are recognized. Individual benefits, which primarily include better business reputation. Improvement of employee morale and competitiveness are consequently reflected in various organizational performance of the company (Crowther, Aras, 2012).

The interrelationship between the strategy of business sustainability and the organizational performance of the company is an issue that has been addressed by companies and economic experts for many years, as confirmed by the results of 159 studies (128 academic studies and 31 business studies) conducted on this topic between 1972 and 2008 and 63% of them came to the conclusion of a positive correlation between business sustainability and organizational performance (Peloza, Yachnin, 2008).

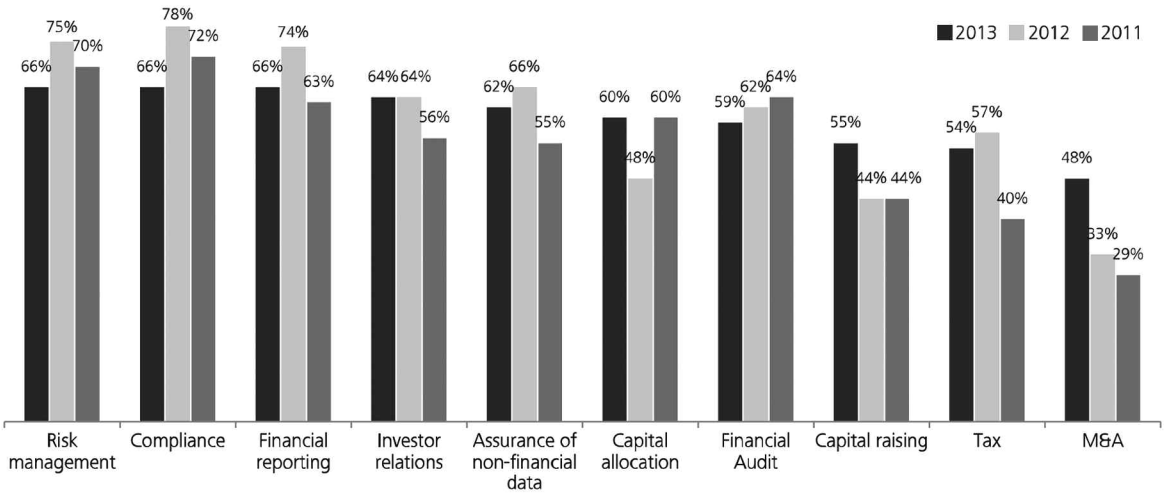
The results of these studies also confirm current research. For example, BSI Group (2014) conducted interviews with 150 employees in sustainability in UK businesses from 20 different industries. On the question of how important is sustainable business to achieving good business results, up to 51% of respondents said that implementing a sustainable business

affects the organizational results of the company over the next two years, confirming the strong correlation between the variables examined.

Company Delloite (2014) conducted a survey of 250 CFOs in 15 different industries from 14 different countries, and specifically 5 continents, in which 84% of respondents saw a direct link between business sustainability and organizational performance. In 2013, Delloite repeated the survey to see how the situation changed. The survey showed a significant year-on-year increase in the number of respondents from the original 49% to 73%, who attribute a strong link to business sustainability and organizational performance.

Individual studies and surveys carried out by different authors from different geographical areas and time periods on the relationship between these variables confirm the existence of this relationship. The vast majority of them showed a positive correlation.

As it is statistically significant, it is clear that, as a result of this relationship, businesses are implementing sustainable development strategies more and more and seeing new impacts on individual areas of organizational performance, which will eventually translate into increasing the competitive potential of companies in the market. The impact of the implementation of the business sustainability strategy on the organizational performance of companies is examined by Deloitte (2011, 2012 and 2013), the results are shown in the following graph.



Source: Delloitte, 2014. CFOs and Sustainability: Shaping their Roles in an evolving environment

The results showed that 250 CFOs identified specific areas of organizational performance directly affected by the implementation of sustainable business initiatives. They identified risk management, compliance with regulations and rules as the most affected areas. Complience and financial reporting with the same percentage of 66%. On the contrary, according to the results of the Delloite survey, mergers and acquisitions are the least affected areas of organizational performance directly affected by the implementation of sustainable business initiatives, but it is also possible to observe the highest percentage escalation compared to 2011, 2012 and 2013, as shown in the graph. This is an increase of over 20%, which is the primary motive for further exploring and identifying the links between the number of cross-border mergers and acquisitions realized in the countries of the European area and the dynamics of specialization in their respective production and service sectors.

Based on the premise that the primary motive for the implementation of various forms of mergers or acquisitions is performance or efficiency itself, considered the most common goal of business integration, while it can be increased mainly through effective management, creating space to examine the development and state of the issue in European area (Konečný, 2012; In Hečková, 2008).

Mergers and acquisitions are therefore an effective tool for companies to further develop, secure new market entry, innovation strategies (Mahirum, Kushermanto, 2018), acquire new product lines, new technologies or know-how, increase competitiveness by achieving a certain size of economies. A successful transaction process is an effective tool to ensure the continued growth of a business and its key strategic, business or financial objectives (Kasych, Vochozka, 2019; Odintsova et al., 2019). The motives for carrying out these transactions correlate to a large extent with general motives and objectives for the pursuit of business activities and the pursuit of concentration, market motives or financial and capital motives.

According to Doughty (Doughty, 2000) for many organizations today, growth is being achieved through acquisition rather than organic growth. Management must take into consideration the business continuity management issues of purchasing other companies. The recovery strategies that have been developed and implemented for the existing organizational critical business processes may not necessarily apply to the “acquired” part of the business.

2. Methodology, Research and Sample

One of the striking outputs of the Delloite study was the finding that the least affected areas of organizational performance directly affected by the implementation of sustainable business initiatives are mergers and acquisitions. However, it was in their case that it was possible to observe the highest percentage increase in the years 2011 to 2013 in comparison with other areas of research. This observation raises an interest in exploring this fact by means of a thorough comparison of the characteristics of the operators operating in the European area by assessing their competitiveness factor. For the purposes of the analysis, a database containing records of cross-border mergers and acquisitions in the European area and Turkey was used, and the data were taken from the Zephyr database (Bureau van Dijk, 2016). Our database includes data on realized mergers and acquisitions from 16 source countries[1] to 25 target countries[2] in selected production[3] and service sectors[4] in the period 1998-2015.

[1] Austria, Belgium, Cypres, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Malta, Netherlands, Poland, Portugal, Spain and United Kingdom

[2] Belgium, Bulgaria, Cypres, The Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Spain, Turkey and United Kingdom

[3] Food, beverages, tobacco, Textiles, clothing, leather, Chemistry, rubber, plastics, non-metallic products, metals and metal products, Machinery, equipment, furniture, recycling, Gas, water, electricity, Construction

[4] Transport, Hotels and restaurants, Post and telecommunications, Insurance, Banking

The main aim of the paper was to identify the interconnection of the number of cross-border mergers and acquisitions in European countries in the production and service sectors in the period 1998-2015 with the dynamics of specialization of the production and service sectors. We used the results of descriptive statistics. We calculated the dynamics of the average specialization of the production and services sectors using the Michaely index (Michaely, 1962), which assesses competitiveness at the level of the selected industry (production and service sectors) based on the difference between the commodity group's share in total national import (Hečková, 2008, s. 122):

$$M_{ij} = \frac{X_{ij}}{\sum X_{ij}} - \frac{M_{ij}}{\sum M_{ij}}$$, while:

X_{ij} – export of commodity group and country j,
M_{ij} – import of commodity group and country j,
ΣX_{ij} – total national export,
ΣM_{ij} – total national import.

For Michaely Index holds:

$0 < M_{ij} < 1$ points to a certain degree of country specialization in a given commodity group,

$-1 < M_{ij} < 0$ indicates insufficient country specialization in a given commodity group.

3. Results

Figure 1 shows the average values with the 95% confidence interval of the Michaely Index for the target countries, so the countries to which cross-border M&A was headed. For countries whose average Michaely Index values are below a straight line (with the y=0 guideline), we are referring to a lack of average country specialization. Other way round, for countries whose average Michaely Index values are above the straight line (with the y=0 guideline), we are talking about the country's average specialization in the sectors we consider (production and service sectors). Industry specialization in the production and service sectors has an important impact on productivity growth in these sectors, which may be the main objective of companies from other European countries wishing to merge in the form of a cross-border merger or acquisition.

Extreme values consist of Malta, Spain and Belgium, where the Michaely Index is below 0 and therefore the countries did not have narrowly specialized production and service sectors, but this did not affect the number of cross-border mergers and acquisitions implemented in those countries. We see that in

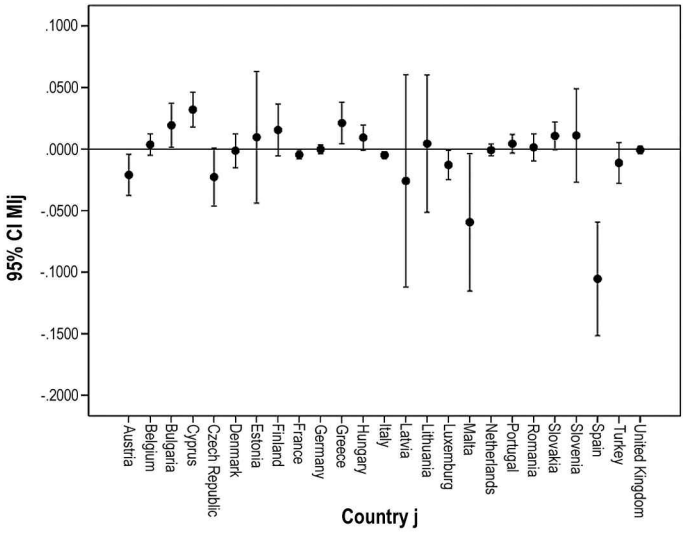


Figure 1. Average values of cross-border M&A across sectors in the target countries of the European Union 1998-2015 *(Michaely index)*
Source: own processing

Malta and Spain there was a high volume of cross-border mergers and acquisitions. The number of cross-border mergers and acquisitions implemented in Malta could have been influenced by low taxes, minimal bureaucracy and fiscal regime. In 2009, Spain was among the three most important European regions for the development of investment activities, which could have had a positive impact on the number of cross-border mergers and acquisitions in the country.

The calculated Michaely index, which is higher than 0 in Bulgaria, Greece, Hungary, the Slovak Republic and Cyprus, indicates the average specialization of countries in the production and service sectors. Using the T bars (T bars – lines leading from points), which show us the 95% confidence interval of Michaely index's average value estimate, we see that the highest number of cross-border mergers and acquisitions realized was in Bulgaria and Greece, which could be due to lower taxes in Bulgaria and Greece's improving business environment.

Table 1 shows the average values calculated by the Michaely index in the target countries of the European Union in the production sector and in the service sector in the reporting period. The Michaely index values are indicated in red and green in the table. Red indicates 25% of the lowest values of the Michaely index and green indicates 25% of the highest values of the index. For each country of European territory, an indication of the number of cross-border mergers and acquisitions made in that production or service sector is recorded. Above-average observations with values higher than 50% of observations are highlighted in yellow in the table. In the banking sector, Austria, Belgium, France, Italy, the Netherlands and the United Kingdom recorded a Michaely index lower than 0, and therefore countries did not have an average specialization in this sector. We see that in the target countries the highest number of cross-border mergers and acquisitions was carried out only in Italy and the United Kingdom, where the lack of specialization in the sector did not affect the implementation of cross-border mergers and acquisitions. In the chemical, rubber, plastic and non-metal products sectors, Austria, Belgium, Greece, Hungary and Luxembourg recorded a Michaely index lower than 0, which means that the countries concerned did not specialize in production in that sector during the reference period. At the same time, however, we can say that with the decline in the Michaely index, there has been a decline in M&A transactions in these countries. In France and Germany, in the reporting period in this sector, the Michaely index was above 0, and therefore those countries had an average specialization in this sector. We see that the higher the value of the index in these countries, the greater the number of cross-border mergers and acquisitions in the sector. For the sector, other services, Austria, Czech Republic, Denmark, Romania and Spain are not closely specialized in the sectors but nevertheless a larger number of cross-border mergers and acquisitions were channeled into the sector over the period under review which involves different sectors. The Michaely index indicates the average specialization in the other services sector in Belgium, Bulgaria, Finland, France, Germany, Italy, the Netherlands, the United Kingdom and Cyprus, which represents a higher specialization of these countries and a higher number of cross-border mergers and acquisitions to the countries. There are extreme cases in Germany, France and the United Kingdom, where the index tells us a value slightly higher than 0, i.e. countries do not have above-average specialization, but an excessive number of cross-border mergers and acquisitions has been channeled to countries which was influenced by the quality of business environment, strong cultural impacts and quality of the environment. Countries in Europe in the remaining production and service sectors, based on Michaely index calculations, do not indicate significant specialization in individual sectors and therefore were not significant for investors from other countries over the reporting period, as confirmed by the number of cross-border M&A transactions carried out in Table 1.

		Banks	Chemicals, rubber, plastics, non-metallic products	Construction	Education, Health	Food, beverages, tobacco	Gas, Water, Electricity	Hotels & restaurants	Insurance companies	Machinery, equipment, furniture, recycling	Metals & metal products	Other services	Post and telecommunications	Primary Sector (agriculture, mining, etc.)	Publishing, printing	Textiles, wearing apparel, leather	Transport	Wholesale & retail store	Wholesale & retail trade	Wood, cork, paper
		Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj	Mlj
Austria	Mean	-0.06	-0.20	.	.	0.02	0.00	0.01	.	-0.03	0.00	-0.01	0.00	.	0.01	0.01	0.01	0.00	0.14	0.00
	Count	14	5	0	0	6	4	1	0	24	4	43	2	0	3	1	1	1	3	2
Belgium	Mean	-0.06	-0.07	0.01	0.00	0.00	0.02	0.00	0.00	0.01	0.04	0.02	-0.01	0.00	0.01	0.00	0.00	0.01	-0.02	0.02
	Count	20	11	2	1	11	10	9	3	14	8	131	3	1	1	1	11	2	12	2
Bulgaria	Mean	0.18	-0.02	-0.04	.	0.00	0.09	0.02	0.01	.	-0.03	0.01	.	-0.07	-0.02	-0.03	0.00	-0.01	-0.06	-0.02
	Count	20	9	3	0	10	11	3	5	0	2	143	0	5	1	4	1	6	5	1
Cyprus	Mean	0.02	.	-0.02	-0.02	0.00	.	.	0.00	-0.06	-0.04	0.10	0.03	.	.	.	-0.01	.	-0.02	.
	Count	51	0	1	3	4	0	0	1	1	3	22	1	0	0	0	3	0	1	0
Czech Republic	Mean	0.20	-0.26	-0.01	.	0.00	-0.01	0.02	-0.01	-0.05	0.01	-0.03	-0.03	0.06	0.00	0.00	0.01	-0.15	0.00	0.22
	Count	18	14	9	0	9	10	1	3	13	9	46	3	1	1	2	4	3	12	1
Denmark	Mean	0.00	0.01	0.01	.	0.00	.	.	.	0.06	-0.01	-0.03	.	0.00	-0.12	.	0.00	.	0.01	0.00
	Count	3	5	1	0	5	0	0	0	19	2	47	0	1	1	0	6	0	7	1
Estonia	Mean	-0.03	-0.34	0.08	.	0.22	0.04	.	.	-0.03	-0.01	0.01	.	.	.	-0.12	-0.09	.	-0.01	-0.03
	Count	2	1	2	0	3	5	0	0	1	1	12	0	0	0	1	2	0	2	1
Finland	Mean	0.00	0.00	.	.	0.00	0.00	.	.	-0.01	.	0.03	.	.	.	.	-0.01	0.00	-0.01	0.04
	Count	2	2	0	0	3	2	0	0	11	0	47	0	0	0	0	11	1	6	3
France	Mean	-0.07	0.02	-0.01	-0.01	0.00	-0.01	0.00	0.00	-0.02	0.00	0.00	0.00	-0.01	-0.01	-0.02	0.00	0.00	0.04	-0.01
	Count	30	34	14	1	32	21	14	10	76	14	424	6	2	22	18	25	5	40	13
Germany	Mean	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.02	0.01	0.00
	Count	30	47	13	2	23	18	9	14	125	15	343	1	4	6	5	25	1	26	21
Greece	Mean	0.07	-0.04	.	.	-0.18	0.00	.	0.00	0.00	-0.06	0.02	-0.07	.	-0.01	.	0.01	-0.02	-0.03	0.00
	Count	47	4	0	0	2	3	0	5	2	1	37	3	0	3	0	3	1	7	1
Hungary	Mean	0.05	-0.02	-0.01	-0.07	0.00	-0.01	0.05	0.00	-0.01	0.00	0.00	-0.04	0.00	.	.	0.02	.	-0.02	0.07
	Count	16	5	4	1	6	8	2	4	4	2	34	1	5	0	0	6	0	4	2
Italy	Mean	-0.02	-0.02	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	0.01	0.00	0.00	-0.01	0.00	0.01	-0.01	0.00	0.03	-0.01
	Count	84	19	3	2	21	24	18	15	43	12	158	11	1	3	6	19	4	20	4
Latvia	Mean	0.31	0.01	.	.	-0.09	-0.08	-0.03	0.04	.	.	-0.05	.	-0.22	.	.	.	.	-0.05	.
	Count	3	3	0	0	2	1	1	2	0	0	10	0	4	0	0	0	0	2	0
Lithuania	Mean	-0.16	0.15	.	.	0.00	.	.	0.07	0.00	.	0.03	.	-0.03	.	.	-0.23	.	.	.
	Count	8	9	0	0	8	0	0	3	1	0	14	0	1	0	0	2	0	0	0
Luxembourg	Mean	0.01	-0.02	.	.	.	.	.	0.00	0.00	-0.06	-0.02	0.00	-0.03	-0.01	.	0.02	-0.01	-0.02	.
	Count	17	1	0	0	0	0	0	2	1	3	49	1	1	2	0	1	1	1	0
Malta	Mean	-0.03	.	.	.	.	.	.	-0.29	.	-0.10	-0.04	-0.02	-0.12	.	.	-0.12	.	.	.
	Count	4	0	0	0	0	0	0	1	0	1	11	1	1	0	0	1	0	0	0
Netherlands	Mean	-0.02	-0.03	0.00	0.01	0.04	-0.01	-0.01	0.00	-0.06	-0.01	0.01	0.00	0.01	0.01	-0.01	0.00	0.01	0.01	-0.01
	Count	25	27	6	2	14	8	6	15	35	11	288	6	10	14	1	22	2	27	3
Portugal	Mean	0.04	-0.03	0.00	-0.01	0.02	0.00	0.01	-0.01	0.00	-0.01	0.00	.	0.02	-0.04	.	-0.02	0.00	0.00	-0.02
	Count	43	23	3	2	12	16	1	2	1	4	56	0	3	4	0	8	1	6	9
Romania	Mean	0.05	-0.04	0.02	.	-0.02	0.00	0.02	0.00	0.06	-0.12	-0.01	0.00	-0.02	.	0.10	-0.03	-0.03	-0.03	-0.04
	Count	34	13	7	0	13	9	3	13	11	7	39	1	4	0	3	1	3	4	3
Slovakia	Mean	0.02	0.01	.	.	-0.01	0.01	.	-0.01	0.00	-0.01	0.02	0.16	0.00	.	.	-0.03	-0.04	0.00	.
	Count	16	4	0	0	4	4	0	1	1	1	12	1	2	0	0	2	1	3	0
Slovenia	Mean	0.08	.	.	.	-0.02	0.00	.	.	-0.05	-0.06	-0.01	.	.	.	.	-0.08	.	-0.14	-0.01
	Count	11	0	0	0	3	2	0	0	2	1	5	0	0	0	0	3	0	3	1
Spain	Mean	0.05	-0.51	0.01	0.03	-0.10	-0.22	-0.06	-0.07	-0.29	-0.06	-0.05	0.01	0.00	-0.01	-0.32	-0.17	0.01	-0.12	-0.01
	Count	38	22	8	6	21	33	8	21	30	8	171	4	4	5	4	16	2	36	6
Turkey	Mean	0.03	-0.08	.	-0.05	0.02	0.03	0.03	-0.02	0.01	-0.01	0.01	.	-0.02	.	0.02	-0.02	-0.37	0.00	-0.02
	Count	15	13	0	1	10	2	2	7	5	7	35	0	5	0	1	1	3	8	2
United Kingdom	Mean	-0.04	-0.02	-0.01	0.00	0.02	-0.01	0.00	-0.02	-0.02	0.01	0.01	0.00	0.00	-0.01	0.00	0.00	0.01	0.00	0.02
	Count	54	33	4	2	28	19	15	10	88	20	360	5	14	15	10	20	4	31	8

Table 1. Competitiveness of the production and service sectors in the target countries of the European Union in the monitored period 1998-2015 analyzed by Michaely index
Source: Own processing

4. Conclusion

The issue of business sustainability has changed significantly in recent years. The economic and social and environmental challenges facing businesses today are quite different from those of the past, when businesses sought to take a position focusing exclusively on green behavior. However, such behavior did not change the nature of their business and was therefore not of a strategic nature. Today, many companies, in particular industry leaders,have begun to see business sustainability as an important component of a business strategy that can reduce costs, take advantage of revenue enhancement opportunities, increase margins, enhance brand value and accelerate organization-wide performance (Healy, Casey, 2013).

The findings revealed by the process of acquiring theoretical knowledge as well as the practical implementation of the research itself have led us to several conclusions. At present, it is difficult to compare the success of business sustainability across companies, as various methods of measuring efficiency at the level of economic, social and environmental pillars, or certificates and standards that capture various problems of measuring business sustainability are used (Global reporting initiative, 2015).

The analysis pointed to the relationship between the impact of the business sustainability strategy and organizational performance, which is also significant in the case of various forms of mergers or acquisitions, with an increased degree of correlation when comparing 2011-2013.

Based on the results of descriptive statistics, our aim was to identify the interconnectedness of the number of cross-border

mergers and acquisitions realized in the European Union countries in the production and service sectors over the period 1998-2015 with the dynamics of specialization in the respective production and service sectors of these countries. Based on the results of descriptive statistics and the Michaely index, we can conclude that the link between the number of cross-border M&As and sectoral dynamics (calculated by the Michaely index) is reflected in most of the countries under review in the reporting period. The number of cross-border mergers and acquisitions have also increased as a result of the specialization of the respective sectors, which can be explained by the fact that sectoral specialization offers both companies the opportunity and the ability to raise their resources through cross-border mergers and acquisitions. Acquiring a foreign existing business allows the acquiring firm to obtain its resources, such as its knowledge base, technology, and human resources, and gain access to markets and to key constituencies at the local level. In the targeted sectors, however, specialization in our sample was not an obstacle to cross-border mergers and acquisitions, precisely because of the very nature of cross-border mergers and acquisitions related to the search for new opportunities for both companies' diversification strategy and personal and top management motives of the companies. However, we can conclude that cross-border mergers and acquisitions are definitely a key subject of research in relation to organizational performance management and business sustainability and thus pose a challenge for the most effective management of business performance in the 21st century.

Acknowledgement

This article was supported by the grant project Vega No. 1/0661/20: “Trends in development and determinants of cross-border mergers and acquisitions in the European area”.

References

[1] Berliner, C. Brimson, J.A. (1988). *Cost Management for Today's Advanced Manufacturing*. MIT Press, Boston.
[2] Bourne, M. (2000). Designing Implementing and updating performance measurement systems. In: *International Journal of Operation and production management*. Vol. 2 No. 1. pp. 754-771.
[3] Bureau Van Dijk (2006). Zephyr (purchased data from the Zephyr database for the period 1998-2015), [online, quoted to 01.02.2020]. Available at: http://www.bvdinfo.com/en-gb/our-products/economic-and-m-a/m-a-data/zephyr
[4] BSI Group (2014). How sustainability standards can drive business performance. [online][cit. 2020-02-12] Available at: <https://www.bsigroup.com/globalassets/LocalFiles/en-GB/standards/BSI-sustainability-report-how-sustainability-standards-can-drive-business-performance-UK-EN.pdf>
[5] Crowther, D., Aras, G. (2012). *The durable Corporation? Strategies for Sustainable Development*. Gower Publishing: Ltd Burlington.
[6] Delloitte (2014). CFOs and Sustainability: Shaping their Roles in an evolving environment. [online][cit. 2020-02-17] Available at: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Risk/dttl-risk-Deloitte-CFOs_and_Sustainability-2014.pdf
[7] De Toni, A., Tonchia, A. (2001). Performance measurement system – models, characteristics and measures. In: *International Journal of Operations and Production Management*. Vol. 1, No. 2. pp. 46-70.
[8] Doughty, K. (2000). B*usiness continuity planning: protecting your organization’s life*. Best practices series. Boca Raton: CRC Press LLC.
[9] Dyer, L., Reeves, T. (1995). Human resource strategies and firm performance: What do we know and where do we need to go? In: *International Journal of HRM*, Vol. 3, No. 1. pp. 656-671.
[10] Gallo JR., P., Čabinová, V., Onuferová, E., Gallo, P., Gallo, J. (2019). The influence of leadership style on the work activity of employees in the selected financial institution. *Quality-Access to Success*, Vol. 20, No. 170, pp. 90-93.
[11] Garengo, P. et al. (2005). Performance measurement systems in SMEs: A review for aresearch agenda. In: *International Journal of Management Reviews*. Vol. 7, No. 1. pp. 25-47.
[12] Gavurová, B. (2010). *Meranie výkonnosti v organizáciách s dôrazom na aplikáciu Balanced Scorecard*. Košice: Vienalla, s.r.o.
[13] Global Reporting Initiative (2015). *GRI and Sustainability Reporting: GRI´s Sustainability Reporting Standards* [online][cit. 2020-02-06] Available at: <https://www.globalreporting.org/standards/getting-started-with-the-gri-standards/>
[14] Guest, D.E. (2011). Human resource management and performance: still searching for some answers. In: *Human Resource Management Journal*. Vol. 22, No. 1, pp. 3-13.
[15] Healy, E. Casey, J. (2013). Driving Sustainability the CFO´s Role. In: *Finance Leadership*. Vol. 45. No. 6. [online][cit. 2020-02-27] Available at: <https://www2.deloitte.com/content/dam/Deloitte/ie/Documents/Finance/CFO/2013_the_role_of_the_cfo_deloitte_ireland.pdf>
[16] Hečková, J. (2008). *Súčasný stav slovenského priemyslu a perspektívy jeho ďalšieho rozvoja*. Prešov: Prešovská univerzita v Prešove. p. 162.
[17] Ittner, C.D., Larcker D. F. (2003). Coming up short on non financial performance measurement. In: *Harvard Business Review*. (November), pp. 88-95.
[18] Kasych, A., Vochozka, M. (2019). The Choice of Methodological Approaches to the Estimation of Enterprise Value in Terms of Management System Goals. In: *Quality-Access to Success*, Vol. 20, No. 169, pp. 21-31.
[19] Kueng, P. (2000). Process performance measurement system: a tool to support process based organizations. In: *Total Quality Management*. Vol. 11, No. 1, pp. 67-85.
[20] Lockamy, A., Cox, J.F. (1994). Reengineering Performance Measurement – How to Align Systems to Improve Processes, Products and Profits. In: *Burr Ridge*: Irwin McGraw Hill.
[21] Maciková, L., Markovič, P. (2017). *Business Sustainability. Bratislava*: Kartprint.
[22] Mahirun, M., Kushermanto, A. (2018). Capital Structure, Investment Opportunity Set, Growth Sales, Firm Size and Firm Value: R&D Intensity as Mediating. In: *Quality-Access to Success*, Vol. 19, No. 164. pp. 65-72.
[23] Mavrinac, S. et al. (1995). *Competitive renewal through workplace innovation: The financial and non-financial return*. Center for Business Innovation. Ernst & Young LLP
[24] Melnyk, S. A. (2005). An empirical investigation of the metrics alignment process. In: *International Journal of Productivity and Performance Management*. Vol. 54, No. 5/6, pp. 290-312.
[25] Michaely, M. (1962). *Concentration in International Trade, Contributions to Economic Analysis*. Amsterdam: North-Holland Publishing Company.
[26] Odintsova, T., Kocherjagina, N., Gordashnikova, O., Ryzhova, O. (2019). Formation of Logistics Services Quality Management Model. In: *Quality-Access to Success*, Vol. 20, No. 168. pp. 21-27.
[27] Otley, D. (1999). Performance Management: A Framework for Management Control Systems Research. *Management Accounting Research*. Vol. 10. Issue 4. pp. 363-382. https://doi.org/10.1006/mare.1999.0115
[28] Patterson, M. West, G. Lawthom, R. Nickell, S. (1997). *Impact of People Management Practices on Performance*, Institute of Personnel and Development, London
[29] Peloza, J., Yachnin, R. (2008). *Valuing Business Sustainability: A Systematic Review*. [online][cit. 2020-03-01] Available at: https://www.stern.nyu.edu/sites/default/files/assets/documents/NBS-Systematic-Review-Valuing%281%29.pdf
[30] Rangone, A. (1996). An analytical hierarchy process framework for comparing the overall performance of manufacturing departments. In: *International Journal of Operations & Production Management*. Vol. 1, No. 3. pp. 104-119.
[31] Sojka, L., Svetozarovová, N. (2016). An analytical view of performance evaluation in telecommunication sector. In: *European Journal of Science and Theology*. Vol. 3, No. 1. p. 255-263.
[32] Svetozarovová, N. (2016). The analysis of the effectiveness of methods of evaluating performance of employees accenting overall performance management process. In: *International Multidisciplinary Scientific Conferences on Social Sciences and Arts*. Vol. 1, No. 1. pp.
[33] Šmída, F. (2007). *Zavádění a rozvoj procesního řízení ve firmě*. Praha, Grada.
[34] Takim, R., Akintoye, A. (2002). Performance indicators for successful construction project performance. In: *18th Annual ARCOM Conference*. pp. 545-555
[35] Turgut, H., Mert, I. S. (2014). Evaluation of Performance Appraisal Methods through Appraisal Errors by Using Fuzzy VIKOR Method. In: *Business and Economics – International Commerce*. Vol. 7, No. 10, pp. 170-178.
[36] Tyson, S., Jackon, T. (1997). *Organizační chování*. Praha: Grada.
[37] Varcholová, T. et al. (2007). *Meranie výkonnosti podnikov*. Bratislava: Ekonóm.

Plan Development to Transform an Ordinary Project Group into a Network Structure

Sergey NOVIKOV[1*], Natalia KOMAROVA[2], Karen DADYAN[3]

[1]Associate professor, PhD, Head of Institute of Engineering Economics and Humanities, Head of Department of Institute of Engineering Economics and Humanities, 125993 Volokolamskoe highway 4, Moscow Aviation Institute (National Research University), Moscow, Russia; E-mail: danonik92@mail.ru, ncsrm@mail.ru
[2]Associate professor, PhD, 125993 Volokolamskoe highway 4, Moscow Aviation Institute (National Research University), Moscow, Russia; E-mail: komarova_n_v2001@mail.ru
[3]Graduate student, 125993 Volokolamskoe highway 4, Moscow Aviation Institute (National Research University), Moscow, Russia; E-mail: airbase2002@mail.ru
[*]Corresponding author

Abstract

The article shows the relevance of creating network project groups (NPG). There are the research goal, the decomposition of it, and other components of the research logical structure. The hypothesis and methodological foundations of the study have been presented. The procedure has been developed to transform the elements and processes of an ordinary project group (OPG) when it is transformed into a network. There are positive changes in such elements of the project structure as interaction and influence in the group, functions and resources of the unit during transformation. Moreover, this transformation is aimed at the fact that it is necessary to preserve the advantages of an ordinary working group and eliminate its shortcomings associated with the isolation of the group. The transformation scheme has also been presented, which allows improving such teamwork processes as working on a product, raising employee awareness and managing group relationships both within the group and with the external environment. The detailing and analysis of each life cycle stages has been carried out taking into account different points of view. The general scheme of calculating the socio-economic effect of the transformation and indicators characterizing this efficiency has been presented.

Keywords: *competitiveness; NPG; plan; project life cycle; socio-economic efficiency; transformation.*

1. Introduction

The relevance of creating NPG to increase the project management effectiveness, especially in the context of complex, non-standard projects in previous scientific papers (Komarova, Zamkovoi, Novikov, 2018; Novikov, Komarova & Dadyan, 2019) has been shown. It has been proved that the NPG combines the capabilities of an OPG and the opportunities brought into it by the personal connections of the participants, that is, an additional resource appears that further provides a competitive advantage for the project group. This is especially true at the present time in the era of transition in the 4th industrial revolution (Komarova, Zamkovoi & Novikov, 2018; Novikov, Komarova & Dadyan, 2019) associated with the radical transformation of production systems and the widespread introduction of information technologies. Thus, planning the transformation of an ordinary group into a network structure is very relevant.

The purpose of this study is to develop a plan for transforming an OPG into a network structure.

The following tasks have been set and solved to achieve this goal in the work:

- analyzing changes occurring at the different life cycle stages of the project and working group;
- developing schemes for transforming OPG into a network structure;
- clarifying content of each stages, functions of managers and executors, as well as indicators characterizing each of the life cycle stages of the project and working group;
- developing a model of NPG according to the characteristics of success and opportunities, which form the basis resource of competitive advantages.
- evaluating the socio-economic efficiency of the transformation of OPG into a network structure.

The study hypothesis is that when using the OPG in the transformation into the network structure of the relevant schemes and plans, characteristics are acquired that ensure the success of the project group and increase its competitiveness.

The study object is to increase the competitiveness of companies.

The study subject is a plan for transforming OPG into a network structure.

The practical significance of the work lies in the conclusions, which can be considered as the basis for the construction and functioning of NPG.

The scientific novelty of the work lies in the fact that a transformation scheme has been identified and the content of each the project and group life cycle stages has been clarified in order to choose the optimal stage for transformation and increase the group's efficiency and its competitiveness (Novikov, Komarova & Dadyan, 2019).

2. Methodology

The research methodology includes the methodology for creating NPG described in the previous authors' works

(Zamkovoi, Komarova & Novikov, 2019), as well as modeling and design of the experiment.

We can collect all the characteristics of the elements and production processes of the NPG in one summary table-diagram (Figure 1) summarizing the results obtained in previous authors' works (Schwab, 2016; Odhiambo, Were & Wabala, 2017).

It is necessary to consider the life cycle of NPG to select the most appropriate stage for transformation, as you can increase employee productivity by adjusting the life cycle in addition. Therefore, the life cycle of NPG can also affect a company's competitiveness to a certain extent.

Even a generalized scheme allows you to determine the information types and data exchange flows with company management or external organizations, as well as with project participants. Detailing a generalized life cycle can provide a basis for comparing projects even if they are heterogeneous due to the specifics of the applied field.

The life cycle stages of the project group require attention and timely management decisions. Each previous stage of the project affects the next one, and may affect the success of the entire project ultimately. There are two following ways to get a network group:

- having built it initially;
- transforming an existing OPG.

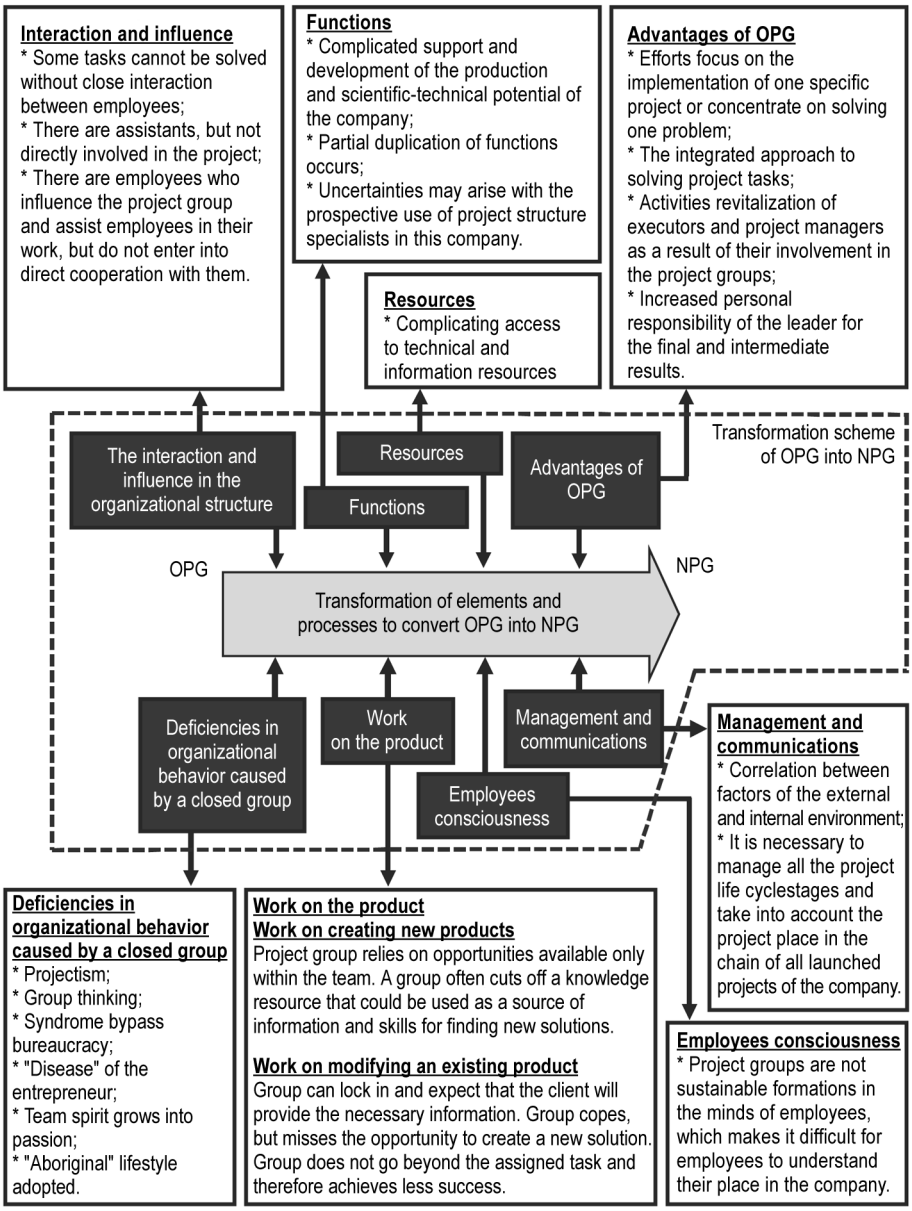


Figure 1. Elements, processes and their characteristics for implementation action plan for creating NPG

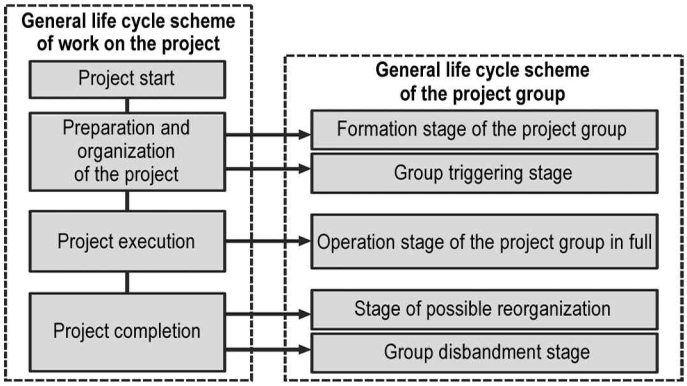


Figure 2.
Reorganization of general scheme of the work life cycle over the project into the overall life cycle diagram of the project group

The only difference is that the minimum number of employees to start is one employee in the first case, and it is two in the second case.

We are considering the situation where an OPG already exists and to increase its capabilities it is not necessary to convert it into NPG. If the group exists, then it is already at some point in the life cycle, and applying transformation measures to it, we will always do this while inside the life cycle, and at some of its stages. Therefore, it is necessary to find out which of the stages is most preferable for the transformation of the group. It is necessary to see everything for this, what happens at each stage and how the result of what is happening affects the subsequent stages.

If we consider already existing OPG as initial state, then the steps for its transformation into a network structure will appear inside the group's life cycle in any case. It occurs because the existence of a project group is impossible outside its life cycle. Consequently, the transformational actions will inevitably go to some stage. Therefore, it is necessary to choose the stage most suitable for changes (Morais, Moura, Beer & Patelli, 2018).

The life cycle diagram of OPG for this purpose with details of each stage has been developed (Figure 3). The scheme below cannot be regarded as universal. However, the main stages reflected in the diagram are present in the life cycle of any model of OPG or NPG.

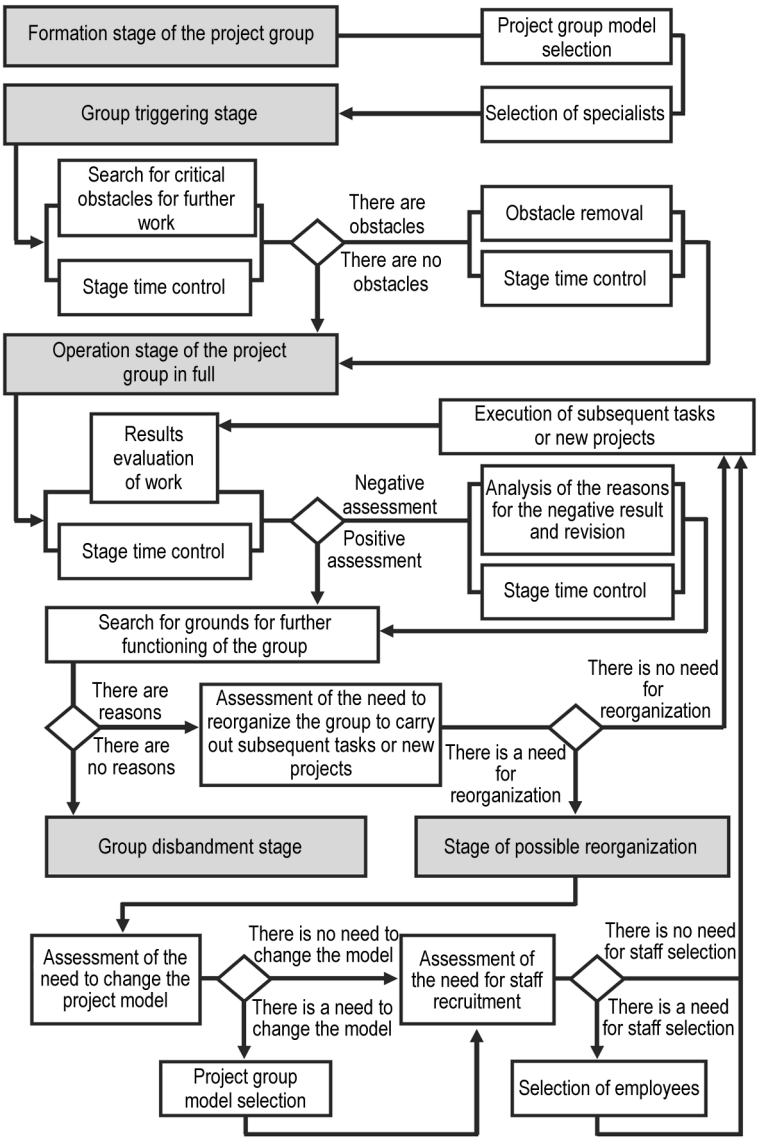


Figure 3. Schematic life cycle diagram of OPG

We will detail and analyze each of the life cycle stages from the following points of view:

- ❑ assessing the plasticity degree of the stage for actions to transform OPG into NPG;
- ❑ choosing the most suitable stage for transformation;
- ❑ development of a list of actions for transformation related to a particular stage, regardless of theirs plasticity degree.

2.1. Formation stage of the project group

The following should be done at this stage:

- ❑ basic requirements are developed in the following categories:
  - education;
  - experience;
  - current competencies;
  - mandatory test tasks similar to project ones;
  - preferences in specialization;
  - psychological tests;
  - general level of development and culture.
- ❑ employees are searched based on basic requirements (see above);
- ❑ testing and evaluation of employees is carried out according to the categories of basic requirements (see above);
- ❑ preliminary acquaintance of group members is organized.

The project leader should do the following at this stage:

- ❑ ensure the formation of favorable relationships;
- ❑ organize effective team work;
- ❑ explain to the group members the main goal of the project;
- ❑ develop common norms and harmonize values;
- ❑ involve project group members in the starting processes;
- ❑ identify comfortable ways to work together;
- ❑ provide employees with all the information necessary to get started.

It is advisable to conduct training activities if it is necessary. But the volume and time of training should not affect the quality and timing of the project.

Qualitative indicators of the group are being developed. The following constant indicators are set:

- ❑ implementation assessment of applied tasks;
- ❑ assessment of the quality and level of employee interaction.

The indicators selected if necessary, to correct the characteristics of a particular group (example) are as follows:

- ❑ punctuality;
- ❑ initiative;
- ❑ sense of humor; etc.

In addition, the effective relationships are built with external participants in the project at this stage.

2.2. Group triggering stage

It is necessary to carry out the actuation of the group at this stage.

The following should be done at triggering stage:

- ❑ communication skills of employees are revealed;
- ❑ differences in approaches and methods of employees are revealed.

This is not always possible to fully identify when selecting personnel at the formation stage of the project group.

The project leader should do the following when identifying differences in approaches:

- ❑ pay more attention to the formation of employees only constructive positions;
- ❑ reallocate roles in the project if it is necessary;
- ❑ take action to maintain a comfortable moral climate in the team.

The following may occur at this stage:

- absence illusion of any tangible results;
- mismatch between the expectations of employees and the reality surrounding them.

Such inconsistencies may trigger conflict situations. We should do the following in this case:

- it is advisable to determine the rights and powers of each employee;
- accurately understand the cause of the conflict situation;
- it is advisable to conduct training or other activities for interaction in the group.

These actions will allow the following:

- create and strengthen team approach;
- form a mechanism of interaction in the group;
- create a comfortable moral climate for work;
- study the characteristics of personality and character;
- strengths and weaknesses of each employee of the group.

2.3. Operation stage of the project group in full

The operation stage is the most important, long and effective for the project.

Therefore, the work environment should be the following to the beginning of this step:

- technological;
- comfortable;
- has an established mechanism of communication and interaction.

All employees should have the following at the beginning of this step:

- clear understanding of their role in the team;
- understanding of the style and format of interaction with colleagues;
- understanding of the methods and procedure for the exchange of technical information;
- understanding the level of corporate culture;
- understanding of a common goal;
- understanding of the position of each employee in the process of achieving this goal.

These parameters can be considered as qualitative indicators of the group. The values of them can be determined by expert assessment.

The following occurs in compliance with the above conditions:

- project group gains confidence in its capabilities;
- improved coherence in action;
- each individual employee begins to feel a sense of pride in the overall achievements of the project group;
- conditions arise to maximize the use of all the experience and knowledge of employees.

It is important to do the following when taking actions to increase efficiency:

- celebrate the success of the group;
- successes of individual employees;
- celebrate their strengths and achievements.

An indicator of the correctness and accuracy of the above actions is the appearance of a synergistic effect.

2.4. Stage of possible reorganization

The stage is not obligatory, but it is necessary when forming and setting up an additional resource, especially in the absence of the necessary competencies.

Reorganization is carried out at the following:

- when changing the scope of work;
- emergence of new types of work;
- if it is necessary to replace employees;
- attracting new employees;
- involvement of temporary experts.

The following features of the reorganization stage are set:

- reorganization can be carried out at earlier stages;
- previous participants in the project may experience discomfort when new ones appear, so the project group may return to the triggering stage;
- some efforts will be required to resolve possible conflict situations;
- it is necessary to focus on improving relations in the group and adjust the behavior of employees;
- qualitative indicator of the actions' correctness will be a situation in which project participants help new employees to join the group and begin to fulfill their duties.

2.5. Group disbandment stage

The group disbands after the project completion. Moreover, the leadership has a different vision of further labor relations as a result of the group qualities.

The following options are possible:

- if the group is objectively considered successful and all employees are psychologically ready for further cooperation, the leader invites the same group or employees to implement a new project as a rule;
- if the group is objectively considered not successful, the likelihood of using it to implement the next project is sharply reduced.

The following occurs at disbandment stage of the project group:

- motivation level of employees may decrease along the path of approaching the project completion;
- interaction mechanism was developed and debugged among employees that creates a feeling of a comfortable working environment;
- employees understand that the established conditions extended to ends;
- take a number of measures that will help to maintain a positive attitude and moral climate, mitigate the negative reactions caused by the disbandment of the group;
- you can start a discussion with the team about the possibility of their participation in the implementation of the next project.

We will build a model to increase the success of the group and increase the company competitiveness, which will be based on the characteristics of success and the opportunities that make it competitive, based on the results of studies we conducted earlier. It was proved in one of the previous works (Somers & Nelson, 2004; Alshawabkeh, Li & Sullabi, 2019) that the main set of characteristics of NPG consists of the characteristics of successful OPG. Characteristics are acquired that ensure its success, when transforming OPG into NPG.

We have observed the work of several successful and unsuccessful conventional project groups for the following three activities in the framework of research in work (Labuschagne & Brent, 2005; Alexander, Ackermann & Love, 2019):

- when creating new products;
- in work with clients;
- while improving operating performance.

The experiments were considered on the work example of OPG, because success is ensured by the same qualities inherent in a regular and NPG. And the development of these qualities provides the basis for creating competitive advantages.

Thus, the results of the performed experiments allow us to state that NPG possesses exactly those qualities of OPG, which ensured its success in carrying out the tasks of the experiments. The research results confirm the assumption that the most effective working method in implementing the project approach is project networks (Brennecke & Rank, 2016; Wen, Qiang & Gloor, 2018).

We formulate a descriptive model of NPG. The following is required to it:

- use common characteristics set that is equally applicable to NPG and OPG;
- no exceptions in the form of characteristics relating to only one of them;

- set of the value of characteristic for each of groups (%) in accordance with the expert assessment.

An expert assessment was chosen because a qualitative change in various parameters can depend on one or several variables, that is, obey various, including non-linear, dependencies.

The characteristics marked with * can be further considered as a part of separate study for more complete regular patterns determination by which the values of these characteristics change. Changing any other characteristics can not only obey (for example, nonlinear dependencies), but also affect other characteristics, that is, correlate with each other. Therefore, it is highly desirable that the aforementioned fact also become the study subject in the framework of some other work.

Some abstract values will be obtained during further study of the regular patterns of change in characteristics, conventional and NPG, which will characterize the success degree of the group, reflecting the success of characteristics' combinations or characteristics separately, and also reflect the picture of the parties that need to be adjusted.

No.	Comparison of OPG and NPG, according to the characteristics that form the basis of studies of project group success	Assessment of OPG, %	Assessment of NPG, %
1	Interest and commitment of participants *	45	75
2	Risks of failure	35	20
3	Risks of prospects for use employees	50	10
4	Relevance of resource due to quick configuration of resource for project tasks	30	95
5	Ability to simplify the search for ideas outside the organization	10	90
6	Ability to increase the resource and capabilities of the group	10	95
7	Combination of stable structure of the project group, and the possibility of influx of new human and technological resources*	20	75
8	Ability to carry out non-standard complex projects with a gain in time in front of other developers	15	95
9	Niche specialism allows you to have a high level of competencies	15	90
10	Depth in performing a narrow task	35	80
11	Distribution of responsibility*	35	85
12	Total resource intensity*	40	90
13	Mechanism for creating and configuring an additional resource *	5	100
14	Security mechanism*	25	15
15	Savings on providing development tools	0	100
16	Savings on renting a workspace	0	100
17	Ability to provide remote work	5	100
18	Ability to search for the best specialists, regardless of their removal	5	100
19	Ability to provide jobs to individuals with health limitations	20	100
20	Ability to attract remote professionals without sacrificing time on bureaucratic procedures	0	100
21	The need to use staffing units to search and test employees	80	10
22	Customer reviews (feedback)	35	100
23	Validity of employee motivation**	10	90
24	Project launch time*	70	10
25	Reaction rate to market changes in relation to the product life cycle *	20	90
26	Reaction rate to market changes in relation to the financial cycle of the project *	15	95
27	Simplification and optimization of management processes *	25	85
28	Increase in the number of successful projects	10	100
29	Impact of the number of successful projects on the company's reputation	50	90
30	Understanding your place in the network structure	55	100
31	Development of regulatory documents for the use of employees as a part of a network project approach	10	90

Table 1. Models' characteristics of an ordinary and NPG

Table 1 illustrates the assessment of the results after the transformation of OPG into NPG, i.e. the actions result in accordance with the developed plan for the transformation of OPG into NPG. In addition, it is important to consider that the effect of the motivation system will affect the results of the changes. This issue is not considered in this paper, but deserves special attention.

It is difficult to assess the effectiveness of the remaining measures proposed in the work, for example, using the motivation subsystem in reliable numbers. Therefore, everything related to motivation has a relative effect. And since the result of many actions is the effect that manifests itself after an indefinite time at the beginning may not occur at all. The effect may not appear as a measurable category and requires attention and effort to evaluate. Therefore, we can only talk about the directions manifestations of the effect. In this case, we are talking about both economic and social effect.

3. Conclusion

The action plan has been developed to create NPG, including a group transformation scheme and optimization of the transformation stage.

The scheme has been developed for transforming OPG into NPG based on an analysis of processes and factors affecting the efficiency of project structures. Using the proposed scheme will save the strengths and overcome the shortcomings of the usual project structure.

The each stages content of OPG has been clarified to identify the systemic nature and features of transformation into NPG, the functions of the managers and executors, and indicators characterizing each of the project and the work group life cycle stages.

References

[1] Alexander, J., Ackermann, F., & Love, P. E. (2019). Taking a holistic exploration of the project life cycle in public-private partnerships. *Project management journal*, 20(10), 1-13.

[2] Alshawabkeh, M., Li, X., & Sullabi, M. (2019). New Information Security Risk Management Framework as an Integral Part of Project Life Cycle. *Proceedings of the 2019 5th International Conference on Humanities and Social Science Research (ICHSSR 2019)*, 319, 133-139.

[3] Brennecke, J., & Rank, O. N. (2016). The interplay between formal project memberships and informal advice seeking in knowledge-intensive firms: A multilevel network approach. *Social Networks*, 44, 307-318.

[4] Komarova, N. V., Zamkovoi, A. A., & Novikov, S. V. (2018). Strategy for changes in the training and education of aviation industry professionals in the transition to the fourth industrial revolution. *Scientific and technical journal STIN (Machine tools and instruments)*, 10, 29-34.
[5] Labuschagne, C., & Brent, A. C. (2005). Sustainable Project Life Cycle Management: the need to integrate life cycles in the manufacturing sector. *International Journal of Project Managemen*t, 23(2), 159-168.
[6] Morais, C., Moura, R., Beer, M., & Patelli, E. (2018). Human reliability analysis – accounting for human actions and external factors through the project life cycle. *Safety and Reliability – Safe Societies in a Changing World*, 329-338.
[7] Novikov, S. V., Komarova, N. V., & Dadyan, K. E. (2019). Development of a motivation system and supporting the success of the internal and external interactions of the network project group. *Amazonia Investiga*, 8(20), 200-209.
[8] Novikov, S. V., Komarova, N. V., & Dadyan, K. E. (2019). Development of the mechanism of formation of additional capabilities of the network design team as the basis of competitive advantages of IT companies. *Amazonia Investiga*, 8(20), 188-199.
[9] Novikov, S. V., Komarova, N. V., & Dadyan, K. E. (2019). Research opportunities to improve the competitiveness by using network project teams. *Research in World Economy*, 11(1), 212-219.
[10] Odhiambo, O. E., Were, S., & Wabala, S. (2017). Influence of project life cycle on information and communication technology project performance in regulated savings and credit cooperatives. *International Journal of Project Management*, 1(1), 167-184.
[11] Schwab, K. (2016). *The Fourth Industrial Revolution*. New-York: Crown Business.
[12] Somers, T. M., & Nelson, K. G. (2004). A taxonomy of players and activities across the ERP project life cycle. *Information & Management*, 41(3), 257-278.
[13] Wen, Q., Qiang, M., & Gloor, P. (2018). Speeding up decision-making in project environment: The effects of decision makers' collaboration network dynamics. *International Journal of Project Management*, 36(5), 819-831.
[14] Zamkovoi, A. A., Komarova, N. V., & Novikov, S. V. (2019). Rethinking the Education of Aviation Specialists for a New Era. *Russian engineering research*, 39(3), 268-271.

Adhesion Quality Assessment of Textile Conveyor Belts through Experimental Methods and Mathematical Modeling

Alexander ALFONSO ALVAREZ [1*], Angel Alexander RODRÍGUEZ SOTO [2], José Luís VALÍN RIVERA [3], Armando DÍAZ CONCEPCIÓN [4]

[1] Assistant Professor, PhD. Universidad de la Serena, Departamento de Ingeniería Mecánica, Facultad de Ingeniería, La Serena, Chile; E-mail: alexander.alfonso@userena.cl
[2,3] Associate Professor, PhD. Escuela de Ingeniería Mecánica, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile; E-mail: angel.rodriguez@pucv.cl; jose.valin@pucv.cl
[4] Professor, PhD. Universidad Tecnológica de la Habana, Facultad de Ingeniería Mecánica y Metalurgia, La Habana, Cuba; E-mail: adiaz@ceim.cujae.edu.cu
[*] Corresponding author

Abstract

The objective of this research is to study the quality of ply adhesion in a conveyor belt. The experiments, models, and simulations were aimed at examining the adhesion strength between layers and the geometric behavior of the specimens. The object of the investigation was a nylon-reinforced neoprene textile belt analyzed as a composite material. The mathematical model used allowed the description of the geometric behavior of the specimens.

Keywords: *textile conveyor belt; adhesion quality; testing; mathematical model.*

1. Introduction

Material handling and transport in varied industries such as mining, food production, recycling among others, are generally carried out through conveyor belts. Due to its functioning, these are subject to pre-stressing, installation, friction and working loads (Hilgraf, 2007). To test the textile conveyor belts quality, these can be considered as a composite material (Marasová, 2019). The correct functioning and durability during its utilization involve the properties of their constituent materials and the adhesion between them. Appropriately, the reliability of the process where these flexible elements are used will depend on the adhesion strength among the different layers, being the debonding, one of the main failures occurred.

Hardygóra et. al. (2015) conducted experimental studies in different configurations of belts used in mining, assessing the joint length influence and the means of cold bonding, obtaining the distribution of shear stress, joint distortion, and the manufacturing defects influence. Though, simulations on these phenomena were not carried out.

According to El Agamy & La liberté (2016), several experimental studies on conveyor belts quality assessment mentioned in the literature refer to different models and phenomena occurred during its performance. Nevertheless, the adhesion phenomenon among the constitutive layers is not reported in this research study.

On the other hand, Błażej et. al. (2017) experimentally tested the creep and stress relaxation phenomena in different individual points as well as in all the joint extension among elastic conveyor belts layers. Additionally, the elongation in different configurations and load times were determined. However, the simulation of the studied phenomena was not carried out.

Consequently, Marasova et al. (2019) assessed the quality of the conveyor belts concerning varied parameters, such as hardness, abrasion resistance, and thermal aging. Furthermore, a general analysis of the belt and the laminated cover components such as composite materials is carried out concluding that the tested properties were determined by thermal aging, and not by material density. On the other hand, the modeling of these phenomena was not executed in their study.

The impact of the type of carcass and the number of plies on the strength of the belt can be simulated through a linear model in its parameters and interactions (Ambriško, 2016). Accordingly, the adjustment of this model is performed by means of linear regression estimation. Furthermore, it is established that belts are composite materials as well as plies adhesion must be taken into account, however, this phenomenon was not tested, so that only the mechanical properties of the material were considered. As well, Fedorko (2018) analyzed the carcass by using metro tomography, where it was demonstrated how failures impact the useful life of the same, establishing that destructive strength tests, even reliable, are not enough to perform these type of analysis.

Peel stress determines the adhesion strength between two elements. Accordingly, Goland et. al (1944) and Volkersen (1938) are used as the bases for the lap joints strength calculation. Ozel (2005) calculated the influence of adherent material thickness in a lap joint failure at the bending moment. Avila (2004) analyzed the advantages and disadvantages of the wavy laps, through experimental tests and simulations through the finite element method of the tensile strength, demonstrating this type of lap increases strength concerning flat joints.

The geometric parameter effect on the tensile strength in wavy laps was analyzed by Nosouhi (2017). To carry out the analysis, two types of resins as adherent material were employed, one of a fragile type and other of a ductile type. In both cases, strength distribution was simulated through the finite element method, where the wavy lap was more resistant than simple

joints. However, the study does not propose a model to calculate strength. This phenomenon is also examined in Fayyaz et al (2017).

To increase peel strength, coatings on the fibers are used to improve adhesion of the reinforcing fiber and matrix. Valantin (2015) tested the action of a Resorcinol-Formaldehyde-latex coating to assess fatigue strength of a textile conveyor belt performing peel tests achieving better results in the coated fibers.

The main objective of this study is to determine the quality of ply adhesion of a nylon-core rubber conveyor belt proposing a mathematical model to describe the geometric strain of the neutral axis when force is applied. Accordingly, peel out strength of varied types and configurations of flexible elements were simulated through the finite element method (FEM). For the validation of the results, experiments were carried out under ISO 252:2007 recommendations.

2. Materials and Methods

2.1. Belt characteristics

The experiment was carried out by using a rubber belt with a nylon core, also known as the core layer. The belt was manufactured by the Japanese company: Bando Conveyor Belts, according to catalog: No. C-01170 and its main specifications:

Layer resistance limit: k_t = 100 kg/cm of width.
Number of layers: i = 4.
Layer thickness: δ_c = 0.9 mm.
Layer material: Nylon (both the warp and the weft).
Top and bottom covers and filler layers material:
Rubber (unknown characteristic).
Top cover thickness: δ_s = 4 mm.
Bottom cover thickness: δ_i = 2 mm.
Layer filler thickness: δ_r = 0.133 mm.
Total belt thickness: δ_b = 10 mm.

2.2. Quality experimental test

The test was conducted in the universal testing machine WDW-2006, maximum capacity of 1000 kN, a measuring range of 0.4%-100%, and relative reading error ≤±1%, with a speed range of 0.005-500 mm/min (≤±1%).

According to ISO 252:2007, it is suggested that the experiment can be carried out optionally with 2 types of test pieces and a total of 3 samples per test. A diagram of the B-type sample is shown in Figure 1, with its parts, where these represent the piece of the test part that will detach from the fixed ones.

According to ISO 252:2007, each specimen was divided among three characteristic models due to the number of plies that will debond at the application of the F force, shown in Figure 1, as IIa, IIb, and IIc. The value of the force applied which debonded the plies is displayed in Table 1.

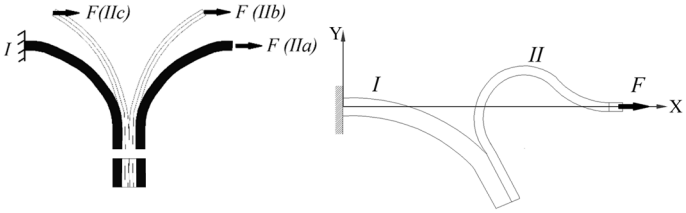


Figure 1.
B-Type specimen for adherence test and load orientation

	Adhesion strength limit [N]			
	Sample 1	Sample 2	Sample 3	Average
Top cover (IIa)	138.458	138.733	157.529	144.907
2 layer (IIb)	138.380	134.986	139.037	137.468
2 layer (IIc)	105.762	105.997	106.478	106.079

Table 1. Values of the adhesive strength limit force among its constituent elements

2.3. Determination of the composite material neutral axis

Before determining the equation of belts behavior, there were obtained the neutral axis distance values, regarding the reference axis, and the flexural rigidity of the sample parts and the system models, followed by the relation between layer properties, the neutral axis location, displayed in Table 1, and the layer cross-section area, shown in the equation (1).

Figure 2 displays an example of the diagram of a two-layer composite where the geometric parameters are defined to calculate the neutral axis.

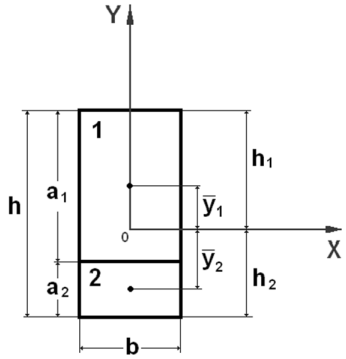


Figure 2.
Geometric parameters of the composite material cross-section

$$\sum_{i=1}^{n} E_i \cdot \bar{y}_i \cdot A_i = 0 \quad (1)$$

Where:
E_i: *i*-Layer elastic modulus [MPa];
$\bar{y}_i$: Distances from the center of the *i*-layer to the neutral axis [mm];
A_i: *i*-Layer area [mm²].

Model	h_1 [mm]
M1PI	2.072
M1PII	1.967
M2PI	1.040
M2PII	1.033
M3PI	0.967
M3PII	1.033

Table 2.
Neutral axis location values

Flexural rigidity $E \cdot I$, is defined as the multiplication of the modulus of elasticity by the moment of inertia. For the composite, the flexural rigidity is determined in Equation (2):

$$(E \cdot I)_{comp} = \sum_{i=1}^{n} E_i \cdot I_i \quad (2)$$

Where:
n: Number of composite material layers;
E_i: Elastic modulus of the i-layer [MPa];
I_i: Moment of inertia, referred to the neutral axis of the composites [mm⁴].

The flexural rigidity values of the layers and those of the system, both necessary for the subsequent behavior calculation, were summarized in Table 3 and Table 4.

Sample	$(E \cdot I)_{belt}$ [Nmm²]
M1PI	135200
M1PII	417.977
M2PI	16640
M2PII	15950
M3PI	49.636
M3PII	15950

Table 3.
Flexural rigidity in the models

Sample	$(E \cdot I)_{sist}$ [Nmm²]
1	416.689
2	8144
3	49.482

Table 4.
Flexural rigidity values of the system of each model

2.4. Adhesion quality model

Before the simulation, there was developed a mathematical model that described the specimen geometry during the

adherence test, which was developed from the neutral axis and considered flexural rigidity.

There were three types of specimens subjected to simulation, thus three different specimen geometries were obtained. To determine the model that defines its geometrical behavior it was required to start from the general equation of the modulus of elasticity of the beams subjected to bending. See equation (3).

$$k = \frac{1}{\rho} = \frac{y''}{(1+(y')^2)^{3/2}} = \frac{M}{EI} \quad (3)$$

Considering the occurrence of large strains, the variation of the bending moment and the equilibrium between the acting loads, the relation between strain, material properties, and geometric parameters can be obtained. See equation (4).

$$y'' = Ax + B[1+(y')^2]^{3/2} \quad (4)$$

Where:

$$A = -\frac{R}{EI} \quad (5)$$

$$B = -\frac{Ax^2\sqrt{(y')^2+1} + 2(y')}{2x\sqrt{(y')^2+1}} \quad (6)$$

$$y' = \tan\theta \quad (7)$$

In equations 5 and 7, the A and y' values were calculated through the R-force and θ, angle values, both obtained experimentally. Figure 3 shows measurement points of the different geometric parameters, summarized in Table 5 for the three types of models.

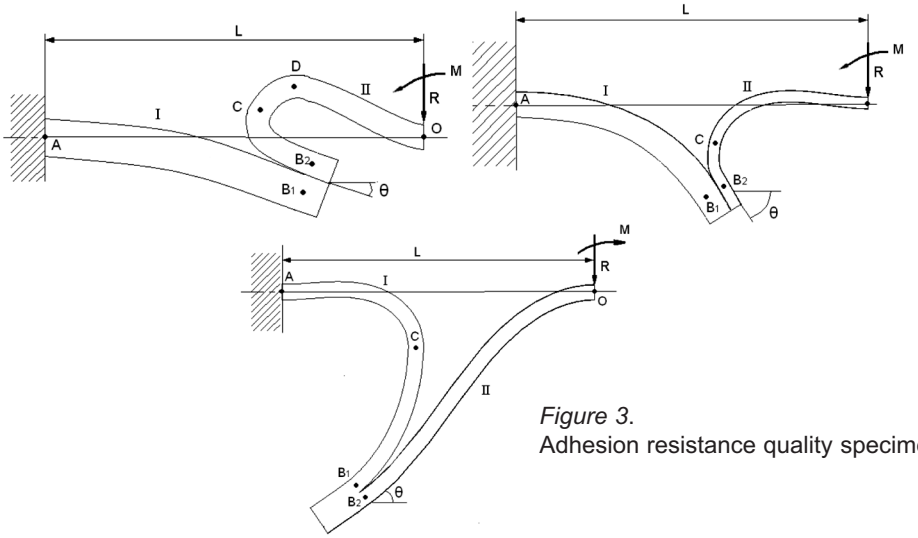


Figure 3.
Adhesion resistance quality specimens diagram

Model	Parameters										
	R [N]	L [mm]	Θ [°]	X_{B1} [mm]	X_{B2} [mm]	X_C [mm]	X_D [mm]	Y_{B1} [mm]	Y_{B2} [mm]	Y_C [mm]	Y_D [mm]
Model 1	2	64	-12	39.5	40	36	44	-7	-4	2	10
Model 2	1	62	-60	34	36	35	-	-16	-13	-9	-
Model 3	0.03	40	41	7	9	18	-	-25	-27	-7	-

Table 5. Values of the parameters measured in each model

By obtaining the neutral axis values from equation 4, it was possible to generate the geometric model to be used in the simulation, as shown in Figure 4.

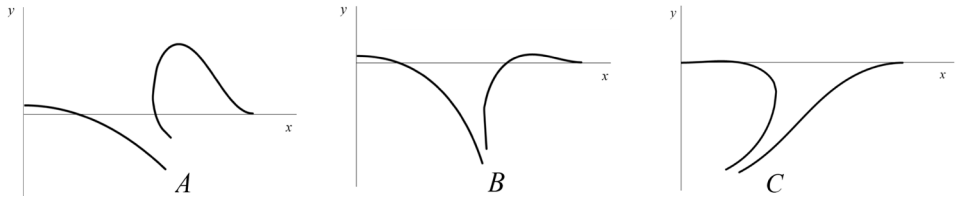


Figure 4. Neutral axis, a) model 1, b) model 2 and c) model 3

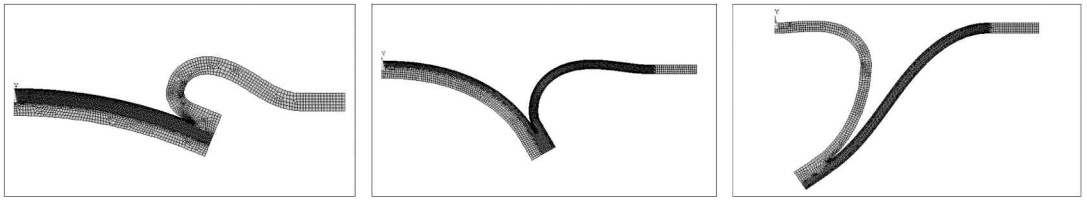
2.5. Adhesion simulation

ANSYS Academic software and two types of elements, Plane183 and Hyper 84 were used. Plane183 that is a two-dimensional, 8-node, two-degrees-of-freedom element, translation in the nodal X and Y locations, exhibits a quadratic displacement behavior and it is appropriate for irregular meshes. Furthermore, distortion of nearly incompressible elastoplastic materials and fully incompressible hyper-elastic materials can also be simulated.

The Hyper 84 Mooney-Rivlin was used to model structures of hyper-elastic solid in two dimensions, and it applies to rubber-like behavior materials with large displacement and strain. Both compressible and nearly incompressible materials can be also modeled. Considering this a two-dimensional, defined by eight nodes, two-degrees-of-freedom element: translation in the X and Y axes. The hyper-elastic formulation of this material is nonlinear and requires interactive solutions.

Accordingly, due to their characteristics, Hyper 84 was used for the rubber elements and Plane 183 for the nylon ones. Additionally, the quad free with smart size 1 was used for meshing.

Figure 5.
Finite element mesh of the models completed



In Table 6 there is a summary of the maximum equivalent stress for the different models in the belt layers.

Table 6.
Equivalent stress values in the adhesion models

Model	σ_{EQV} [N/mm^2]
1	1.922
2	3.426
3	3.473

The simulation accurately described the observed distortion in the experimental tests, demonstrating that the mathematical model that describes this geometry was suitable for the study of debonding between the layers of these flexible elements.

The equivalent stress values obtained through the simulation are within the expected range. Alphonsus (2004) establishes that for rubber-based adhesives the peel stress is in the range of 1.8-7 MPa, as well, Budynas (2014) establishes the range of 0.88-3.5 MPa for hot melted synthetic mixtures. Accordingly, the values obtained were considered satisfactory, since they are in the range between 1.9 and 3.4 MPa as displayed in Table 6.

3. Conclusions

The mathematical and finite element models applied provided similar results to those obtained through the empirical experiment, allowing testing the quality of ply adhesion of the analyzed conveyor belts.

The geometric models obtained, based on the neutral axis equation, describe the behavior of the actual belts accurately, demonstrating that the procedure followed was correct and can be adapted to the adhesive quality testing of other belt configurations.

The equivalent maximum resistance values observed in the actual samples as well as in the simulated models are situated among the acceptable range considering older studies in the related literature.

References

[1] Hilgraf P. (2007). Wear in bulk materials handling. *Bulk Solids Handling*. vol. 27, pp. 464-477.

[2] Marasová D., Ambriško L., Caban L. (2019). Determination of the quality of rubber composites based on their testing. *Quality-Access to Success*, vol. 20, No. 173, pp. 18-21.

[3] Hardygóra M., Bajda M., Błażej R. (2015). Laboratory testing of conveyor textile belt joints used in underground mines, *Mining Science*, vol. 22, pp. 163-171.

[4] ElAgamy N., Laliberté, J. (2016). Historical development of geometrical modelling of textiles reinforcements for polymer composites: A review. *Journal of industrial textiles*, Vol. 45(4) pp. 556-584.

[5] Błażej R., Bajda M., Hardygóran M. (2017). Monitoring creep and stress relaxation in splices on multiply textile rubber conveyor belts. *Acta Montanistica Slovaca*, vol. 22, No. 2, pp. 116-125.

[6] Ambriško L., Marasová D., Grendel P. (2016). Determination the effect of factors affecting the tensile strength of fabric conveyor belts. *Maintenance and Reliability*, vol. 18. No. 1, pp. 110-116.

[7] Fedorko, G., Molnár, V., Dovica, M., Tóth, T., Fabianová, J., Strohmandl, J., Beluško, M. (2018). Analysis of defects in carcass of rubber-textile conveyor belts using metrotomography. *Journal of Industrial Textiles*, 47(7), pp. 1812-1829. https://doi.org/10.1177/1528083717710712

[8] Goland, M, Reissner, E. (1944). The stresses in cemented joints, *Journal of Applied Mechanics*. Vol. 11, pp. A17-A27.

[9] Volkersen O. (1938). Rivet strength distribution in tensile-stressed rivet joints with constant crosssection. *Luftfahrforschung*, vol. 15, pp. 41-47.

[10] Ozel, A., Demir, A., O, Semsettin, T. (2005). The effects of adherend thickness on the failure of adhesively-bonded single-lap joints. *Journal of Adhesion Science Technologic*, vol. 19, pp. 705-718.

[11] Avila, A., Bueno, O. (2004). An experimental and numerical study on adhesive joints for composites. *Compos Struct*, vol. 64 (3-4), pp. 531-537.

[12] Fayyaz, N., Mohammadreza, F., and Mahdi, A. (2017). Experimental and numerical study on the composite adhesive joint reinforcement using wavy edge. *Journal of Adhesion Science and Technology*, 32:9, 1007-1017, doi:10.1080/01694243.2017.1395578

[13] Valantin, C., Lacroix, F., Deffarges, M.P., Morcel, J. and Aït Hocine, N. (2015). Interfacial damage on fatigue-loaded textile-rubber composites. *J. Appl. Polym. Sci.*, 132(4), https://doi:10.1002/app.41346

[14] ISO 252:2007 (2007). *Conveyor belts. Adhesion between constitutive elements. Test methods*.

[15] Alphonsus V. P. (2012). *Adhesion and Adhesives Technology, an Introduction*. Third Edition. Carl Hanser Verlag, Germany.

[16] Budynas, R, G., Nisbett, J. K. (2014). *Shigley´s Mechanical Engineering Design*, Tenth Edition, Mc Graw Hill Education, New York.

Monitoring and Prediction the Quality of High-Tech Products in Conditions of Warranty Exploitation

Vladimir KOZLOVSKIY [1], Dmitriy AYDAROV [2*], Dmitriy BLAGOVESHCHENSKIY [3], Vera VAKHNINA [4], Konstantin SAVELYEV [5]

[1] Doctor of Technical Sciences, Head of the Department of Theoretical and General Electrotechnics, Samara State Technical University, 244 Molodogvardeyskaya str., 443100, Samara, Russia; E-mail: kozlovskiy-76@mail.ru
[2] Candidate of Technical Sciences, Associate Professor at the Faculty of Engineering and Technology, Samara State Technical University, 244 Molodogvardeyskaya str., 443100, Samara, Russia; E-mail: adv_tol@mail.ru
[3] Candidate of Technical Sciences, Head of the State Regional Center for Standardization, State Regional Center for Standardization, 91 Boldina str., 300028, Tula, Russia; E-mail: csm@uncnet.ru
[4] Doctor of Technical Sciences, Head of the Department of Power Supply and Electrical Engineering, Togliatti State University, 14 Belorusskaya str., 445020, Togliatti, Russia; E-mail: V.Vahnina@tltsu.ru
[5] Doctor of Technical Sciences, Associate Professor at the Faculty of Engineering and Technology, Samara State Technical University, 244 Molodogvardeyskaya str., 443100, Samara, Russia; E-mail: savelev.kv@samgtu.ru
[*] Corresponding author

Abstract

This paper presents the results of the design and implementation of a methodology allowing us to monitor and predict the quality of cars during the warranty exploitation period. Because there are cars with unfinished warranty exploitation period, the defects number value on these cars is incomplete. Accordingly, defects do not have time to show on some cars. In this connection, the task of the adduction of car quality indicators should solve first.

Keywords: *product quality; service quality; warranty; quality prediction; exploitation; automotive industry.*

1. Introduction

Methodological aspects are crucial within the problems related to organizing the process of quality monitoring for high-tech products at the lifecycle stages since the level of their development and formalization impacts the efficiency of the measurement process and the adequacy of taken company strategic decisions (Aaker, 2009; Xu et al., 2017; Kozlovskiy et al., 2018; Aydarov et al., 2019a, 2019b). The reality is that the top management of corporations is frequently not completely knowledgeable about the information on technical and economic quality characteristics of the products. At the same time, the thesis of the essential importance of quality indicators of hi-tech products and related services in shaping the competitiveness has been recognized by experts for a long time (Klochkov et al., 2019; Stylidis et al., 2019).

Thus, it becomes clear that a set of indicators reflecting technical and economic quality characteristics of cars developed considering the modern condition of information technologies, requirements of international standards, strategic vision of company development, is a topical problem, which, if solved, stipulates the automaker efficiency growth.

When developing quality assessment methods, their versatility should be taken into account, since the calculation system should be base on the product quality coordinate systems for the automaker, corporate service chain, as well as final customers. The most understandable quality assessment criteria for the above process participants will be the indicators reflecting the defectiveness level and costs for ensuring the operating effectiveness. In the context of mass production, these indicators and their various interpretations constitute the basis for organizing the monitoring process.

The aim of this study is to propose a complex methodology for estimating the primary indicators for the quality monitoring process of cars during warranty exploitation considering the type of production process.

2. Mathematical presentation

Let's introduce the key designations for the analysis objects:

- A – car (all models in general);
- M_i – model;
- m_i – modification;
- RS_i – group;
- RP_i – subgroup;
- RY_i – unit;
- RD_i – detail;
- D_i – defect;
- W_i – guilty department;
- Y_i – after-sales service enterprise;
- V – production volume by objects "car", "model" and "modification";
- R – number of claim objects "car", "model" and "modification";
- T – labor intensity to defects eliminating;
- S_p – defects spectrum value.

Below are given the calculation formulas for determining the quality indicators within the proposed complex methodology.

Defects number:

$$D = \sum_{i=1}^{n} D_i \quad (1)$$

Total costs (Z), service costs (ZY), spare parts costs (ZZ), materials costs (ZM):

$$Z = \sum_{i=1}^{n} Z_i;\ ZY = \sum_{i=1}^{n} ZY_i;\ ZZ = \sum_{i=1}^{n} ZZ_i;\ ZM = \sum_{i=1}^{n} ZM_i \quad (2)$$

Average costs for the one produced car:

$$Z^V = \frac{\sum_{i=1}^{n} Z_i}{V};\ ZY^V = \frac{\sum_{i=1}^{n} ZY_i}{V};\ ZZ^V = \frac{\sum_{i=1}^{n} ZZ_i}{V};\ ZM^V = \frac{\sum_{i=1}^{n} ZM_i}{V} \quad (3)$$

Average costs for the one rejected car:

$$Z^R = \frac{\sum_{i=1}^{n} Z_i}{R};\ ZY^R = \frac{\sum_{i=1}^{n} ZY_i}{R};\ ZZ^R = \frac{\sum_{i=1}^{n} ZZ_i}{R};\ ZM^R = \frac{\sum_{i=1}^{n} ZM_i}{R} \quad (4)$$

Average defectiveness for the one produced car:

$$\overline{D}^V = \frac{\sum_{i=1}^{n} D_i}{V} \quad (5)$$

Average defectiveness for the one rejected car:

$$\overline{D}^R = \frac{\sum_{i=1}^{n} D_i}{R} \quad (6)$$

Average labor intensity for the one defect eliminating:

$$\overline{T} = \frac{\sum_{i=1}^{n} T_i}{\sum_{i=1}^{n} D_i} \quad (7)$$

Rejection level:

$$R^V = \frac{R}{V} \quad (8)$$

Proposed complex methodology for calculating the quality indicators includes such an assessment criterion as the defects spectrum value Sp, which is calculated by sampling from the archive of an electronic database of defects (except for the repetitive ones). Quality indicators dynamics analyzed using the time series built using the car production dates. Time series represents a sequence of values of quality indicators arranged by production dates. Time series analysis performed through building the trend line and assessing the parameters.

A relation between the values of *x* and *y* for some plurality is modeling by linear dependence $y=\alpha+\beta x$. Availability of chance variations caused by the influence of multiple factors and measurement errors non-considered in our equation results in the following form: $y=\alpha+\beta x_i+\varepsilon_i$. Here ε_i are the random errors (deviations, disturbances). Our task is to determine the estimated coefficients α and β from the available observation data $\{x_i\}$ and $\{y_i\}$.

Line $y=\alpha+\beta x$ may always be built by the observation points, which will be the closest line to the observation points. The proximity criterion is

$$Q = \sum_i e_i^2 = \sum_i \left(y_i - (a + bx_i)\right)^2 \to \min \quad (9)$$

Minimization of *Q* is performing by the least square method. In the trend line equation, the significance of coefficient *b* is checked by analyzing its relation to standard deviation

$S_b = \sqrt{D(b)}$, where

$$D(b) = \frac{S^2}{\sum_i \left(x_i - \overline{x}\right)^2},\ S^2 = \frac{\sum_i e_i^2}{n-2},\ e_i = y_i - a - bx_i \quad (10)$$

In case of complying with the assumptions, the value S_b has the Student's *t*-distribution with $(n-2)$ degrees of freedom (n – the number of observations):

$$t = \frac{b}{\sqrt{D(b)}} = \frac{b}{S_b} \quad (11)$$

Dispersion of free term in the regression equation is

$$D(a) = D(b)\frac{\sum_i x_i^2}{n} \quad (12)$$

Assessment of statistical significance of the coefficient *a* is carried out similarly to estimating the coefficient b by using the Student's t-distribution.

Further, we use the coefficient of determination denoted R^2. It is a measure allowing to determine the extent to which the found line better explain the behavior of variable *y* as compared to the simple horizontal line $y=\overline{y}$. If there is a statistically significant linear correlation, then $R^2 \sim 1$.

A coefficient of determination is calculating by the formula:

$$R^2 = 1 - \frac{\sum_i e_i^2}{\sum_i \left(y_i - \overline{y}\right)^2} \quad (13)$$

To determine the statistical significance of R^2, the null hypothesis is checking. The F-statistic is

$$F = \frac{R^2(n-2)}{1-R^2} \quad (14)$$

3. Main study results

Because there are cars with unfinished warranty exploitation period, the defects number value on these cars is incomplete. Accordingly, defects do not have time to show on some cars. In this connection, the task of adduction of cars quality indicators should solve first. The task consists in predicting the future values of quality indicators by the available incomplete data. Below is given the method of adduction on an example of average defectiveness for the rejected cars.

1. Use the information about cars of the last six release months with expired warranty exploitation. Calculate the following indicators with a breakdown by the warranty exploitation time (for one month, for two months, for three months, etc.):

- At (AT) – the number of rejected cars/models/modifications after t months of warranty exploitation (or for the entire warranty exploitation);
- Dt (DT) – the number of defects on cars/models/modifications after t months of warranty exploitation (or for the entire warranty exploitation).

2. Calculate the shares of indicators for each warranty exploitation time:

$$P_t^A = \frac{A_t}{A_T},\ P_t^D = \frac{D_t}{D_T} \quad (15)$$

3. Determine the coefficient of adduction for each warranty exploitation time:

$$k_t^D = \frac{P_t^A}{P_t^D} \quad (16)$$

4. To obtain the adduced values of average defectiveness, the actual (incomplete) values of average defectiveness multiplied by the respective coefficients of adduction.

Table 1 illustrates the adduction results of average defectiveness for the passenger cars of one of the leading national

t	0	1	2	…	T
A_t	202	963	1738	…	5755
D_t	371	2229	4706	…	34811
P_t^A	0.04	0.17	0.31	…	1
P_t^D	0.01	0.07	0.14	…	1
k_t^D	3.29	2.61	2.23	…	1

Table 1. Calculating the coefficients of adduction for average defectiveness

automakers. At the time of analysis, the cars in question are considered to have completed the warranty period. Using the warranty exploitation database for the cars produced within that period, let's calculate the indicators A_t and D_t for different exploitation periods (t=0, 1, …, T).

Let's calculate the shares of rejected cars (Figure 1) and the shares of showed defects (Figure 2) depending on the exploitation period (Table 1):

$$P_0^A = \frac{202}{5755} = 0.04,\ P_1^A = \frac{963}{5755} = 0.17,\ \ldots\ P_T^A = \frac{5755}{5755} = 1,$$

$$P_0^D = \frac{371}{34811} = 0.01,\ P_1^D = \frac{2229}{34881} = 0.06,\ \ldots\ P_T^D = \frac{34881}{34881} = 1$$

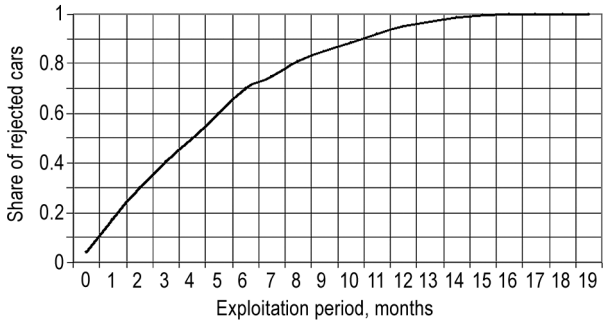


Figure 1. Distribution of rejected cars

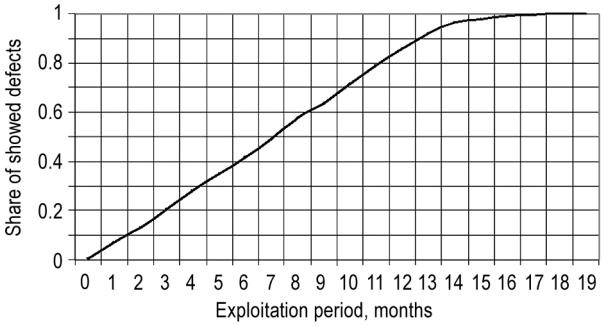


Figure 2. Distribution of showed defects

Figure 3 presents the coefficients of adduction. To obtain the adduced values of average defectiveness, the actual values of average defectiveness multiplied by the respective coefficients of adduction.

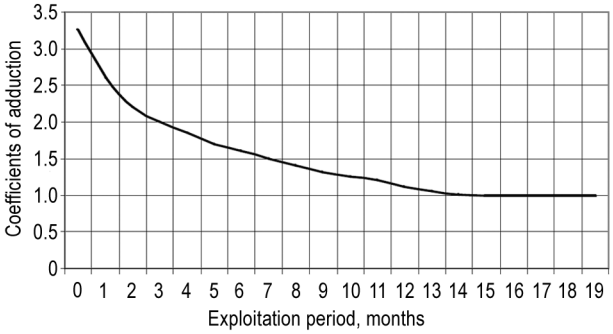


Figure 3. Coefficients of adduction for average defectiveness

4. Conclusions

A complex methodology designed allowing us to monitor and predict the quality of new cars during the warranty exploitation period. A distinctive feature of the proposed methodology consists of its focus on practical application in compliance with different demands of the automotive industry as the mass production sector of the economy.

Further activities towards the development of the proposed complex consist of its intellectualization within the framework of industrial corporate information systems with integrating the calculation algorithms of quality indicators to the existing product quality assessment structure.

Acknowledgements

This study has performed within President Grant for government support of leading scientific schools of the Russian Federation (НШ-2515.2020.8).

References

[1] Aaker, D.A. (2009). *Managing Brand Equity*. New York: Simon and Schuster.

[2] Xu, L., Blankson, C., & Prybutok, V. (2017), Relative Contributions of Product Quality and Service Quality in the Automobile Industry, *Quality Management Journal*, Vol. 24, No. 1, pp. 21-36.

[3] Kozlovskiy, V.N., Aydarov, D.V., & Shanin, S.A. (2018), Development and Realization of Approach for Defining Quality Objectives of Carmaker According to Results of Cars Warranty Period, *Science & Technique*, Vol. 17, No 4, pp. 320-330.

[4] Aydarov, D., Kozlovskiy, V., Vakhnina, V., & Kleymenov, S. (2019a), Remote Monitoring System for Quality Assessment of Car Service Enterprises, *Quality-Access to Success*, Vol. 20, No. 170, pp. 85-89.

[5] Aydarov, D., Kozlovskiy, V., Vakhnina, V., Fomina, T., & Ivanova, D. (2019b), Strategic Planning of Cars Quality in Operation, *Transport and Telecommunication*, Vol. 20, No. 1, pp. 74-81.

[6] Klochkov, Y., Gazizulina, A., & Muralidharan, K. (2019), Lean six sigma for sustainable business practices: a case study and standardisation, *International Journal for Quality Research*, Vol. 13, No. 1, pp. 47-74.

[7] Stylidis, K., Wickman, C., & Söderberg, R. (2019), Perceived quality of products: a framework and attributes ranking method, *Journal of Engineering Design*, Vol. 31, No. 1, pp. 37-67.

Development of Lean Manufacturing in Quality Management System

Tatyana ADREEVA [1], Dmitry SHVIDENKO [2], Lola POPOVA [3*], Mariya KRUPODEROVA [4], Olga GRIMASHEVICH [5], Roman CHERKASHNEV [6]

[1,2] Plekhanov Russian University of Economics named after Plekhanov G.V., Moscow, 117997, Russian Federation
[3] Saratov State University, Saratov, 410012, Russian Federation
[4] Company JET, Saratov, 410031, Russian Federation
[5] Saratov State Technical University named after Gagarin Yu. A., Saratov, 410054, Russian Federation
[6] Tambov State University, Tambov, 392000, Russian Federation
[*] Corresponding author; E-mail: lolafaritpopova@gmail.com

Abstract

The article observes the use of lean manufacturing tools companies in the scope of quality management system as a way of productivity and financial stability of contemporary industrial companies. The implementation of quality management system and lean tools can give a significant effect to companies. The positive experience and challenges of implementing LEAN tools within the quality management system in Russian industrial enterprises are highlighted. The results of using the lean manufacturing tools on railway transport enterprises prove the effectiveness of this concept in solving the main problem of the quality management system, improving the quality of products (services), increasing the efficiency and effectiveness of enterprises performance.

Keywords: *lean manufacturing; labor productivity; quality management system.*

1. Introduction

Lean manufacturing in modern conditions of Russian reality is becoming an actual and popular tool for enterprise management, as it is aimed at improving labor productivity, competitiveness and quality of products or services. The philosophy of lean production implies a radical change in traditional production approaches, covering the entire management system and corporate culture and becoming a unified way of thinking for all employees. Unfortunately, the introduction of lean manufacturing in Russian enterprises is often a haphazard and random process due to the lack of a theoretical, methodological and regulatory framework. But despite this, over the past 10 years many enterprises in the country working in various fields have joined the implementation of lean production and productivity improvement programs. At the state level the Federal labor productivity improvement Project of the Ministry of economic development of the Russian Federation "Systemic measures to increase labor productivity" was opened and started to be implemented, aimed at creating conditions for increasing labor productivity. The main objectives of this project: to ensure that by 2024, the growth rate of labor productivity on mid-sized and large enterprises of the basic non-oil sectors of the economy below 5% per year; provide more than 20% increase in productivity. Within the framework of this project, targeted support is provided, consisting of qualified assistance from experts to eliminate the inefficiency of the production process directly at the participating enterprises of the national project, training employees of participating enterprises in methods of improving labor productivity, as well as support for employment [1].

2. Methods

The goal of lean manufacturing is to systematically reduce processes and operations that do not add value and by eliminating losses within the company's processes. Traditionally, losses are understood as processes that do not create additional value for consumers. This task is implemented by focusing on principles, depending on national characteristics, some differences in approaches to organizing lean production have traditionally formed, which significantly affects the results of their use (Fig. 1). For example, the Japanese model of quality management, which is the most effective, is characterized by teamwork, timely and open exchange of information, iden-

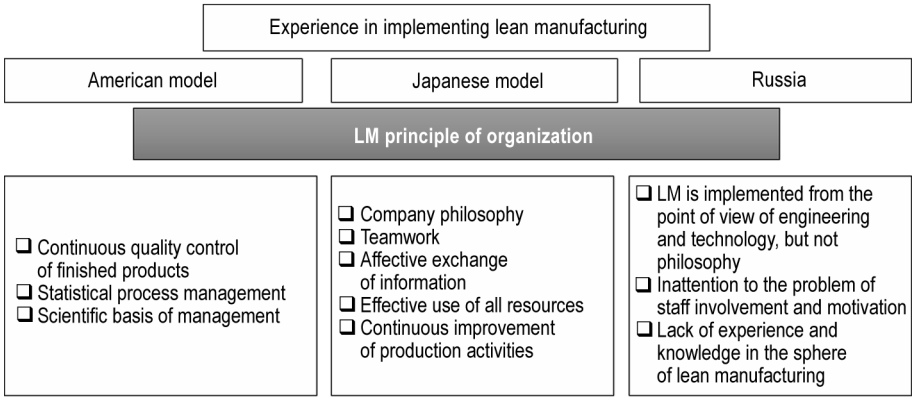


Figure 1.
Comparison of national quality management systems and lean manufacturing

tification and rapid response to problems, saving all types of resources and continuous improvement of production activities.

This way, the experience of the world's largest manufacturers shows that lean production is a breakthrough low-budget method of quality management, developed by E. Deming, J. Juran, brought to perfection by S. Toyoda, K. Toyoda, T. Ono at Toyota Motor Co., which includes optimizing processes, focusing on consumer needs, improving product quality and creating a system of continuous improvement. The return on investment ratio is from 3:1 to 300:1. Accurate adherence to the principles of lean manufacturing has helped companies such as Toyota, Ford, General Electric, Nissan, Caterpillar, Bridgestone, Xerox, Scania, Alcoa, Boeing and others to achieve and maintain leadership in their industries for many decades.

To achieve the goals of improving the effectiveness and efficiency of the QMS, enterprises that have implemented lean manufacturing technologies most often use the following recognized tools: loss elimination, workspace management system-5S; quick changeover (SMED); production and supply management system-Kanban or just-in-time (JIT); error protection and prevention system (Jidoka); value stream maps; continuous improvement-Kaizen; universal equipment care system (TRM); universal flow management system-TFM; quality mugs, etc. [7.]

Analysis of statistical data on the use of the main tools of the lean production concept in Russia as a whole shows a fairly low percentage of implementation. For example, twice more companies have implemented similar tools abroad (Fig. 2).

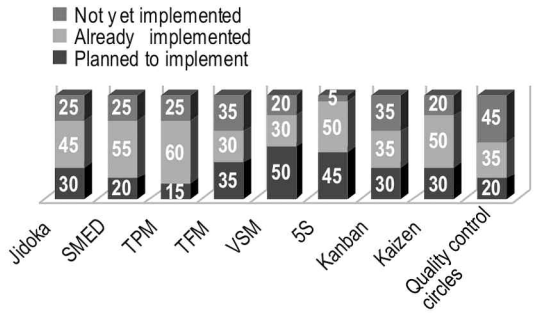


Figure 2. Results of implementation of lean production tools by domestic industrial enterprises

3. Results

Many industries in the leading countries of the world use the concept of lean manufacturing as one of the main tools of the strategy aimed at improving the quality of products and services and increasing efficiency. The generalized results of using lean production tools show a reduction in the production cycle by 30 %, a reduction in the share of scrap in the total output of about 30%, and an average increase in productivity by 25%.

However, in practice, the introduction of lean production tools in most cases is a disordered process, for which there is no unified system of theoretical knowledge, regulatory documents, guidelines and instructions. In this regard, it becomes extremely necessary to study the experience of implementing and developing methodological approaches for using various lean production tools in order to develop various options for development strategies, universal methodological approaches for various economic entities [6].

In the unstable conditions of the modern economy, lean production solves the main task for almost all types of activities – it increases the efficiency of activities in conditions of limited resources. Lean production is not just short-term measures to reduce losses by optimizing the number of employees, reducing the area of warehouses and production sites, and other costs, but first of all-optimizing business processes in order to eliminate redundant functions and procedures that create additional work and, consequently, costs, but do not create additional value.

Due to the short time period for the adoption of foreign experience, QMS and lean manufacturing are implemented only by individual companies that are in a situation of entering global markets. According to the majority of business leaders, the main reason for failures in implementing lean production tools in domestic industrial enterprises is the reluctance of staff, primarily workers in production, to learn and apply elements of foreign concepts. In addition, very little attention is paid to integrating Lean tools with modern production management information technologies [3]. Despite the active business positions of many industrial enterprises that use lean production tools, the analysis showed the presence of a whole set of problems associated with this. One of the main problems is the erroneous approach of many managers of lean production projects-this is a blind copying of the experience of foreign enterprises. The Japanese experience of implementing the concept of Kaizen and lean manufacturing, associated with the modernization of production, is used in a truncated form by most Russian enterprises. According to the interview conducted among the heads of industrial enterprises in the Saratov region that implement lean production technologies, only 16% of enterprises have comprehensive approach to the production system modernization, 22% of enterprises are also engaged in modernization, but are limited to certain aspects of work or production sites. Many enterprises-18% are engaged in modernization and implementation of lean production, using their own forces and experience. The majority of enterprises 44% do not think about upgrading production systems (PS) at all (Fig. 3).

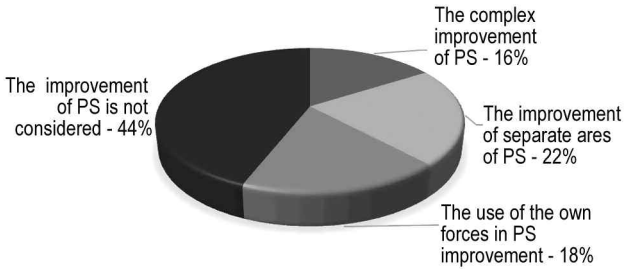


Figure 3. Problems of Russian enterprises in implementing the concept of lean production

The failure of both the organizational and, above all, the financial plan to get the appropriate experience in implementing the concept of lean production is the main problem of failures or lack of inspiring results. Honed to perfection lean manufacturing technologies that demonstrate high results in improving the efficiency and effectiveness of production should be studied and correctly transferred to the soil of Russian business. And if specific technologies and tools, as well as mechanisms of their implementation must be implemented in the version of the source, then a thorough understanding of the philosophy, given the existing initial conditions of the Russian mentality, the need for proper organization of the process of introduction and implementation and the active involvement of the staff in these processes should be adapted to the peculiarities of Russian business and take control of the management of the enterprises.

Analysis of the current situation has shown that serious problems are associated with the lack of a full understanding of the need for a comprehensive approach to the implementation of the concept of lean production. This gives rise to a number of particular problems, including personnel who are not prepared for changes, who are not trained in the appropriate methods of organization and technology of production processes, and personnel who are not involved in this process and are not motivated to implement changes. The presence of all these problems can be noted among the management staff at various levels.

The problem field of implementing lean production tools has been identified as possible options for the development of lean production within the framework of the QMS of domestic industrial enterprises (table 1).

Problem	Strategy	Used tools of the lean manufacturing method
Lack of understanding of the essence of lean manufacturing philosophy	Strategy for studying lean manufacturing philosophy, accepting experience and learning	Benchmarking, training, continuous improvement
Low staff involvement	Strategy of active involvement and motivation of staff	Study of best practices of motivation and involvement of staff, training, continuous improvement of activities
Low technological discipline and poor organization of production technology (equipment maintenance, workplace organization)	Strategy for comprehensive modernization and optimization of production process	Optimization, compactification, processes, TRM system, 5S, Kanban, visualization, standardization of work, quick changeover, spaghetti diagrams, TFM, JIT

Table 1. Problems and strategies for implementing lean manufacturing tools

Currently, the trend of implementing lean production tools is actively gaining momentum. An example of their successful implementation and use can be such domestic major corporations as Rosatom, Russian Railways, KAMAZ, and others that demonstrate significant results in improving labor productivity, improving the quality of products and services. The website of the Ministry of economic development of the Russian Federation presents the results of the project for the last 5 years, leading enterprises to improve labor productivity through the use of lean production tools (Fig. 4).

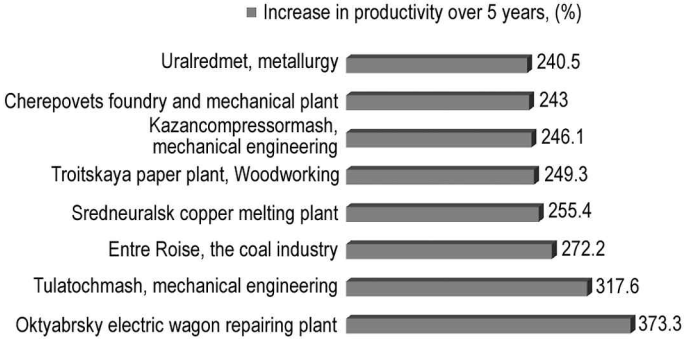


Figure 4. Enterprises-leaders in labor productivity growth in Russia for 5 years
Source: Ministry of economic development of the Russian Federation

4. Discussion

Despite the active business positions of many industrial enterprises that use lean production tools, the analysis showed the presence of a whole set of problems associated with this. According to a survey conducted among the heads of industrial enterprises in the Saratov region that implement lean production technologies, only 16% of enterprises comprehensively approach the problem of production modernization, 22% of enterprises are also engaged in modernization, but are limited to certain aspects of work or production sites. Many enterprises – 18% are engaged in modernization and implementation of lean production, using their own forces and experience. The majority of enterprises, 44% do not think about upgrading their production systems at all.

The lack of financial and organizational opportunities to gain relevant experience in implementing the concept of lean production is the main problem of failures or lack of inspiring results. Honed to perfection lean manufacturing technologies that demonstrate high results in improving the efficiency and effectiveness of production should be studied and correctly transferred to the soil of Russian business [10]. And if specific technologies and tools, as well as mechanisms of their implementation must be implemented in the version of the source, then a thorough understanding of the philosophy, given the existing initial conditions of the Russian mentality, the need for proper organization of the process of introduction and implementation, and staff involvement in these processes should be adapted to the peculiarities of Russian business and take control of the management of the enterprises [11].

Railway transport enterprises are a key element of the economy and an important link in the Russian transport system. 46% of cargo is transported by rail, and the passenger turnover is 24%. The growth of the country's economy largely depends on the stable operation of railway transport enterprises and their infrastructure.

Over the past 10 years, rail transport companies have been operating and will continue to operate in the near future in a tough competitive environment. They face challenges to significantly improve efficiency, reduce costs and losses, and develop infrastructure and customer service. According to experts, the main losses at railway transport enterprises are related to technological failures. It is in the fight against this type of loss that an important resource of thrift lies. Technological failures significantly reduce the quality of operation of all railway transport.

Quality management in the development strategy of JSC "Russian Railways" first appeared in 2007. Changes in the international standards ISO 9000 series, which occurred in 2015, have made adjustments to the quality management activities at railway transport enterprises, which necessitated the revision of the regulatory framework in the field of quality management. The basis for building an up-to-date regulatory framework in the field of quality management is the key requirements of GOST R ISO 9001-2015, related to strengthening the position of the process approach, the introduction of risk-based management, special attention to the development of strategic goals of the company and, in this regard, the need to analyze the context of the enterprise and its stakeholders. The current version of the standard pays special attention to leadership and employee engagement, as well as knowledge management [2,5]. The new requirements call on organizations to focus on the requirements of all interested parties, and therefore the owners of the enterprise and its employees. Therefore, there is a question of epy production efficiency increase. The implementation of the lean production concept helps Russian Railways enterprises achieve growth in economic efficiency and high development indicators. The long-term goals of the Russian Railways holding set out in the holding's strategy until 2030 are related to improving the efficiency of production processes, a deep understanding and effective satisfaction of all customer needs, search for ways to constantly improve the quality of services and increase efficiency. Currently, these tasks are of particular importance and the main factor in management decisions. One of the methods of the production system growth focused on the customer and allowing to improve the internal performance of the company is the lean production [12].

In 2015, the Volga railway branch of Russian Railways adopted an order to implement a lean production system within the quality management system and identified several pilot sites, one of which is the Anisovka motor wagon depot. A working group was created, training was organized for managers of the Directorate and depots, foremen and locksmiths of pilot sites, KPIs were established for sites, SOP, regulations and standards were developed, and individual lean production tools were implemented [8].

As part of the implementation of the TPM concept (Universal care of equipment), work was organized to carry out repairs of rail buses on their own. To do this, work was carried out to build maps of the current and future state of value streams and time-based observations to identify the loss of working time. As a result, by reducing the identified losses and use of mechanized equipment planning complexity was reduced by 11.3%, from

8910 person per hours to 7904 people per hour, network, overhaul of the rail bus is reduced from 60 to 55 days. All activities carried out within the framework of TRM are aimed at eliminating the main types of losses, especially those related to technological failures that reduce the efficiency of enterprises [4]. In general, the adopted strategy of simultaneous application of both breakthrough and small, but constant improvements allowed the Directorate to ensure: profit growth; increase in profitability; increase in the repair program by 30%; increase in the number of staff of the Volga Directorate of motor wagon rolling stock by 85 staff units; increased productivity growth due to the introduction of new workshops, an increase in the repair program by 6.2%.

Based on the analysis of the using lean production tools results, the following key factors for the success of implementing the concept of lean production in railway transport enterprises are formulated.

1. Focus on the company's long-term development goals. Choosing an effective lean manufacturing tool.
2. Optimize processes by identifying problem areas by classifying actions that make up the value stream into three categories: actions that create value for consumers; actions that do not create value, but are necessary to ensure the main production; actions that do not create value for consumers, which need to be eliminated.
3. Full involvement of all company personnel in the implementation of the lean production concept. Minimization of control, evaluation of employees' performance based on a clear system of indicators.
4. Orientation of the production system to eliminate the maximum share of losses, continuous improvement.

We propose to systematize the entire range of lean production tools in accordance with the key success factors of implementing the lean production concept, as well as the main functional areas of its implementation. This classification option can be useful for industrial enterprises implementing the concept of lean production.

Based on the analysis and generalization of this information, a conceptual model of lean production implementation has been developed, which identifies the key success factors for the implementation of this concept (long-term orientation, process approach, employee involvement and development, and continuous improvement of activities), as well as the main functional areas (strategy, processes, personnel, improvements). The functional and logical structure of this model is superimposed on the continuous improvement cycle of PDCA, in accordance with the main principle of quality management – continuous improvement of activities (Fig. 5).

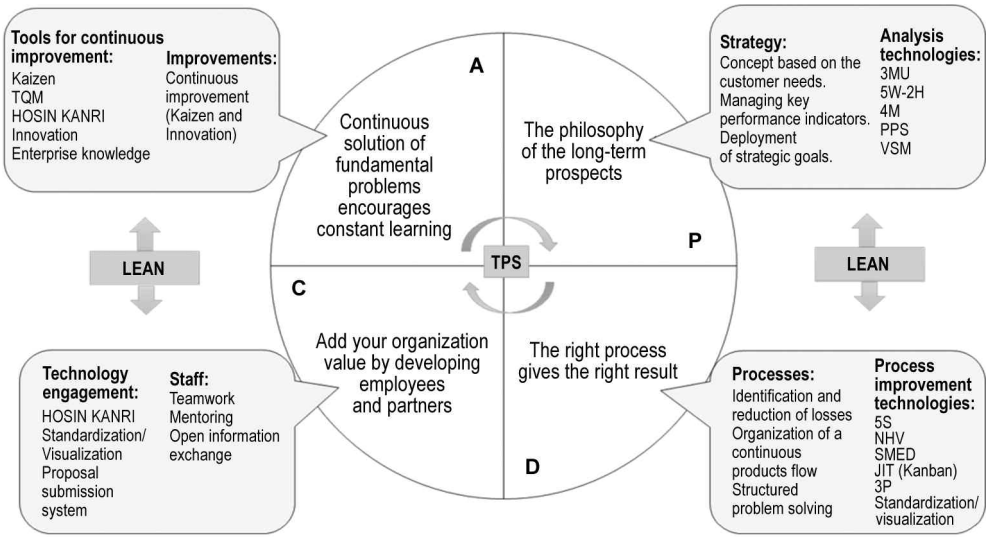


Figure 5. Conceptual model for implementing lean manufacturing

5. Conclusions

To sum up, the new economic conditions, customer orientation, and digitalization set ambitious goals for the management of railway transport enterprises, forcing them to pay more and more attention to modern quality management tools, including lean production, that can "optimize the use of material and labor resources, reduce the time for operations, increase labor productivity, improve labor protection conditions, reduce the cost and improve the quality of transportation, contributes to the growth of customer-oriented and competitive railway transport". Therefore, the development of a quality management system based on lean production tools is an urgent scientific and practical task. However, it is necessary to adapt and prepare their use taking into account the specifics of railway transport enterprises.

References

[1] Andreeva T. A. (2016). Integrated system of quality management and strategic management / *Science and business: ways of development*. No. 1(55). pp. 57-64.

[2] Andreeva T. A., Babynina L. S., Popova L. F., Ryzhakova A.V., Yashina M. N. (2019). Adaptation Mechanism of the quality management system of Russian industrial enterprises to the requirements of international standards in the transition to the 6th technological order / *Plekhanov scientific Bulletin*. No. 1(15). pp. 19-33.

[3] Andreeva T. A., Gugelev A.V., Ivashina M. M., Zhulina E. G., Matushkin M. A., Popova L. F. et al. (2019). *Digitalization aspects in the formation of effective management strategies* / ed. Popovoy L. F. / / Saratov Socio-Economic Institute (branch) Plekhanov Russian University of Economics, 159 p.

[4] Glukhova L. V., Antsiborov A. N. (2018). *Management of production processes modeling in the environment of CA ERWIN PROCESS MODELER PJSC "AVTOVAZ"* / *Actual problems of Economics and management*. No. 4(20). pp. 46-52.

[5] GOST R ISO 9001-2015. *Quality Management System. Requirements* – Moscow: Standardinform, pp. 10-11.

[6] Grimashevich O. N. (2018). Strategic management of companies in the digital economy / *Bulletin of the Saratov State Socio-Economic University*. No. 5(74). pp. 9-11.

[7] Gugelev A.V., Andreeva T. A., Popova L. F. (2017). Tools for quality management of industry standards / *Bulletin of quality*. No. 2(137). pp. 43-48.

[8] Lean manufacturing in Russian Railways. *Innovation digest*. http://www.rzd-expo.ru/innovation/orporativnaya_quality (accessed 12.12.19).

[9] Popova L. F. (2017). Improving quality management in the PDCA cycle / *Bulletin of the Saratov State Socio-Economic University*. No. 4(68). pp. 68-72.
[10] Yashin N. S., Andreeva T. A., Serebryakov A.V. (2014). Problematic issues of strategy implementation / *Bulletin of the Saratov State Socio-Economic University*. No. 5(54). pp. 50-54.
[11] Andreeva T. A., Popova L.F., Yashina M, Babynina L., Yaksanova N., Natsypaeva E. (2019). Integration of the quality management and strategic management systems into unified management enterprises system / *Quality-Access to Success*. Vol. 20, No. 171, pp. 3-9.
[12] Andreeva T. A., Grimashevich O. N., Ivashina M. M., Natsypaeva E. A., Kolesnikova D., Kontorovich E. (2019). Improvement of industrial enterprise quality management system based on risk-oriented approach implementation/*Quality-Access to Success*. Vol. 20. No. 169. pp. 42-46.

Effectiveness of Housekeeping Methodology on Productivity in the Automotive Parts Manufacturing Organisation in South Africa

Robert Walter Dumisani ZONDO

Senior Lecturer / HOD: Department of Entrepreneurial Studies and Management,
Durban University of Technology (DUT), Durban, South Africa
E-mail: dumisaniz@dut.ac.za

Abstract

The majority of South Africans expect greater prosperity that can be accomplished through greater employment and high productivity. Thus, the need for productivity improvement in South Africa should be uppermost in both the public and private sector's agenda. This can be achieved by implementing an effective management system that has a bearing to improved business performance. This sentiment underpins the concept of housekeeping methodology, namely, the 5S. 5S is a housekeeping philosophy represented by the practical approach for sorting, set in order, sanitise, standardise and sustain. As a result, this study evaluates the effectiveness of 5S on productivity in the automotive parts manufacturing companies in South Africa. 5S is an approach designed for achieving overall organisational cleanliness and standardisation at workplace that is motivating and pleasing to all the employees in the organisation. The study was quantitative in design and examined the production and related experiences of the automotive parts manufacturing company that has adopted a 5S strategy. The Ordinary Least Squares (OLS) model, using Statistical Package for Social Sciences (SPSS) was used to analyse data. The company operates in the eThekwini District Municipality in KwaZulu-Natal. The study was achieved by collecting pre- and post-quarterly data for machine downtime and labour production output rate. The results establish that machine downtime has a relationship and statistically significant to productivity. However, productivity has no relationship with both the 5S and labour production output.
This study uncovers the strengths and weaknesses of 5S strategy on productivity in the automotive parts manufacturing organisations in South Africa.

Keywords: *automotive; business performance; cleanliness; housekeeping; machine downtime; organisation; productivity; standardisation; 5S.*

1. Introduction

Productivity performance is one theme that has generated tremendous interest amongst economic scholars for decades. A common thread running through this discourse is a strong affirmation of the central place of productivity enhancement in the precipitation and perpetuation of growth (Venter, 2004). In developing countries, the need to improve productivity performance is particularly useful given the less favourable economic circumstances that confront most developing countries. In the competitive world of manufacturing, organisations face challenging problems such as quality losses, production downfall, material wastage, safety, and employee-related issues (Golroudbary and Zahraee, 2015). These problems weaken their growth. The two significant challenges such as competitiveness and efficiency of firms, have impelled the number of manufacturing organisations to implement innovative management strategies (Zahraee, Hashemi, Abdi, Shahpanah and Rohani, 2014). This includes the housekeeping strategies like 5S.

The 5S principles have emerged from Japanese Toyota Production System (TPS) in the mid-1950s for realising significant improvement in the process performance. Its methodology has emerged as a strategic business process improvement strategy widely deployed by manufacturing, as well as service organisations to enhance their manufacturing performance. 5S philosophy has emerged from five Japanese terms- *Seiri*, *Seiton*, *Seiso*, *Seiketsu* and *Shitsuke* which stand for sorting, set in order, sanitize, standardise and sustain; respectively (Ho, 1997). It is a methodology for creating well-defined organisation, neat and clean, highly efficient, productive and quality workplace. Since its origin, the practice of 5S has been recognised as the base foundation for quality improvement programmes which significantly improve organisational working environment and industrial management processes (Ho, 1999a). Takshi Osada has been envisioned as the pioneer in introducing the concept of 5S in the Japanese organisations as a philosophy of improving lifestyle through the strategy of organisational development, learning and change (Kobayashi, Fisher and Gapp, 2008). Hiroyuki Hirano proclaims an alternative approach of 5S with a practical approach, treating it as a tool of eliminating waste from the workplace to enhance competitive position among other organisations (Khanna and Gupta, 2014). Osada (1991) and Hirano (1996) proclaim their different visions and views regarding the concept of 5S. Takashi Osada's vision about 5S is more of conceptual management philosophy. However, Chapman (2005) describes the housekeeping methodology of 5S as a potential to effectively manage and organise various operational activities for the production of defect free products with less human energy, time, capital, wastage and cost. 5S principles facilitate an organisation to sustain continuous

improvement, with better safety standards throughout the organisations (Ho, 1999a).

Hirano (1995) proclaims that 5S steps are designed to improve efficiency, strengthen performance and provide continuous improvement in virtually all segments of the organisation. These steps involve a structured improvement programme with a series of identifiable steps related to each other in progressive manner. As the words are related to Japanese language, Ho (1999b) has removed the complexity of Japanese words so that it can be easily understood and adopted by various organisations across the globe for realizing significant organisational performance improvements. Some organisations find it hard to imbibe 5S principles and believe that it is only a clean-up process and too busy to implement it (Hirano, 1995). Patten (2006) has emphasised that 5S is much more than clean-up. It is a philosophy for systematically achieving overall organisation cleanliness and standardisation at workplace that is motivating and pleasing to all the employees in the organisation. 5S is a philosophy for reshaping the workplace and providing foundation for significant improvements at workplace. It changes the approach of the employees toward their work, workplaces and improves communication among various business functions and departments. A well-organised workplace provides a safe and efficient production environment, which boosts the employee morale, promotes the feeling of ownership, pride in their work and ownership of their responsibilities. Since its introduction and acceptance by Japanese's firms in Japan, 5S practice has been successfully deployed in many countries around the world. Hence, this study evaluates its effect on productivity. It is guided by the following research questions (RQs):

- RQ1: Is 5S an appropriate methodology for productivity improvement in the automotive parts manufacturing organisations in South Africa?
- RQ2: Is 5S a suitable methodology for the reduction of machine downtime for productivity improvement in the automotive parts manufacturing organisations in South Africa?
- RQ3: Does 5S has the ability to increase labour production output for productivity improvement in the automotive parts manufacturing organisations in South Africa?

2. Problem statement: Low productivity level in South Africa

South Africa experiences a slow productivity growth of -0.4% in 2014 (Zondo, 2018), as well a decline in total factor growth of -3.3% (Conference Board, 2015). Consequently, companies are faced with the challenge of promoting innovation in productivity improvement among employees (Zondo, 2018). Their productivity in the manufacturing sector is low when compared to Korea, the United States of America (USA), Taiwan, Japan, France and the United Kingdom (UK) (Klein, 2012). It is against this background that the study focuses on 5S, given the low productivity levels in the South African manufacturing industries (UNIDO, 2013). Hence, this study investigates whether 5S can increase productivity in the selected automotive parts manufacturing companies. It explores the suitability of 5S as an appropriate tool for productivity improvement.

The rest of the paper discusses the literature that was reviewed in this study, the methodology employed, study results, as well as the discussion of results. In addition, it deliberates on the implications of results for policy and practice, study limitations, conclusion, as well as future research required.

3. Literature review

This section presents an overview of 5S. It discusses the effect of 5S on productivity. The 5S as a strategic tool for business performance concludes the theoretical context of the study.

3.1. Overview of 5S as an improvement tool

5S is an outstanding Japanese philosophy for the development of any type organisation all over the world (Randhawa and Ahuja, 2017). It is a Japanese philosophy that imbibes its cultural and societal values for improving motivation, ethical values of all employees in the organisation. The Japanese principles of Shintoism (cleanliness of mind), Confucianism (Orderliness) and Buddhism (self-discipline) have led to the evolution of 5S philosophy (Dogan, Ozkutuk and Dogan, 2014; Ikuma and Nahmens, 2014). These principles are frequently referred by Shinto (the way of the Gods: Shintoism), do (methodology), butsudo (Buddhism) and (kendo, jyudo, and karatedo) martial arts for training mind and body through discipline (Sugiura and Gillespie, 2002). During 1950-1955, Japanese had pioneered the evolution of first two 2S elements (*Seiri*, *Seiton*), and thereafter TPS facilitated evolution of first 2S to today's 5S elements (*Seiri*, *Seiton*, *Seiso*, *Seiketsu* and *Shitsuke*) and promoted 5S applications to other industries later on (Sawada, 1995). 5S principles are often associated with productivity and quality initiatives is being used to examine each job process in order to eliminate routine and wasteful activities that pose potential safety hazards (Becker, 2001). Some researchers emphasise that 5S concept has its origin from Japanese values and ethics from the times of Samurais and it came into existence after World War II through TPS to attain improved quality, productivity, employee's morale value, safety and delivery goals (Gao and Lowa, 2014). A few researchers also emphasise that the concept of 5S is the fundamental requirement for the operation of TPS (Monden, 1998). Many researchers argue that successful implementation and practice of 5S in any organisations requires a total commitment from top management to bottom level employees of the organisations. They believe that 5S practice must be the integrated part of the management system for every organisation (Hirano, 1996; Ho, 1997; Bicheno, 1998; O'hEocha, 2000). While some authors emphasise on certain other factors bearing significant impact on 5S implementation such as the need to change, evolving organisational goals and objectives, culture, communication among employees, time policy management, the execution of each S in systematic manner by 5S team, leadership, maintaining basic requirements of programme to start and maintenance of 5S system. 5S technique significantly improves the environment, safety and health standard of the organisations (Young, 2014; Srinivasan, Ikuma, Shakouri, Nahmens and Harvey, 2016).

It must be emphasised that 5S is a method to enhance the quality standards of both product and process, cut down operation costs and improve the process performance (Liker and Hoseus, 2008). It helps in providing order and discipline in the organisation with the supervision on even the smallest details of company (Erdal, 2007). 5S initiatives facilitate continuous improvement of the work environment by reducing non-value adding activities for improving the efficiency, safety and better controlled of work area. The effectiveness of 5S implementation depends significantly upon certain human factors like employee commitment, training, competencies and sustainability initiatives (Ebadi, Safari, Habibi, Akbari and Rezapour, 2015). Young (2014) proclaims that 5S encourages streamlined inventories, clutter-free workspaces, and processes to maintain housekeeping standards. Its tool is used in healthcare to reduce inventory, create space, and reduce travel and search times. Khanna and Gupta (2014) have conducted the case studies regarding the effectiveness of 5S and TQM implementation in the Indian organisations. The successful implementation of 5S results into the implementation of TQM which further significantly improved quality, productivity, time delivery, safety, employee's morale values and cost optimisation in the Indian organisations to make them more competitive in the global market. Sanchez, Rodriguez, Maruyama and Salazar (2015) have deployed 5S methodology for improving manufacturing processes at Colombian Small and Medium Enterprises (SMEs). The study

validated the existence of positive relationship between the manufacturing performance factors and implementation of 5S methodology with evidence of improvement in productivity (83% - 68%) and quality (36% - 67%) based on performance measurements, as well as improvement of the organisational climate (18% - 33%). Ishijima, Eliakimu and Mshana (2016) have established that 5S implementation approach has significantly contributed towards reduction of patients' waiting time at outpatient departments (OPDs) of hospitals in Tanzania leading to improved satisfaction of clients for both patients and health workers. The implementation of 5S methodology not only play significant role in the development of manufacturing sector, but it also make remarkable evolution in defence, banking, mining, agriculture, hospitals and construction sector (Randhawa and Ahuja, 2017).

3.2. The effect of 5S on productivity

The operational practices of 5S have been associated with better performance in many studies of world-class manufacturing (Sakakibara, Flynn, Schroeder and Morris, 1997; Shah and Ward, 2003). More particularly, quality management practices also allow organisations to achieve similar improvements in the manufacturing performance (Mann and Kehoe, 1994; Flynn, Schroeder and Sakakibara, 1995; Martı´nez-Lorente, Dewhurst and Gallego Rodriguez, 2000; Merino, 2003). Specifically, 5S implementation helps to organise the work environment, standardise the work flow and assign clear ownership of process to employees. Its implementation yields fast production results. Hirano (1995) in Japan, and Hartmann (1992) and Willmott (1994) in Western companies, showed that some companies have enhanced their competitiveness through the combined application of total productive maintenance and 5S. Kumar, Antony, Shingh, Tiwari and Perry (2006) show that the 5S system helps to increase productivity by reducing idle time in some processes, and also ensured the health and safety of employees. Gapp Fisher and Kobayashi (2008) linked manufacturing improvements to the creation of a better workplace when 5S was implemented.

3.3. 5S as a strategic tool for business performance

5S is the foremost technique required for the superior efficiency in the production and quality of products through waste elimination. This is a main reason behind the practice of 5S at a workplace of any organisations (Pheng and Khoo, 2001). It is the methodology of building the quality work environment with desired standards and strongly support of continuous improvement in the organisations. Due to its effectiveness, it has emerged as a popular practice in the manufacturing and services organisations of Japan and western world (Ho and Cicmil, 1996). As the 5S words are typically related to the Japanese language, different authors have removed the complexity of language for better understanding and applications in the western organisations as depicted in Table 1 (Ho, 1999a).

Japanese language	English language	Meaning	Importance
Seiri	**Sort (organize)**	Sort unneeded items	Effectively manage and utilise space, time, energy, money and other resources
Seiton	**Set in order**	Priority wise orderliness of items	A place for everything and everything in its place
Seiso	**Shine**	Cleanliness of workplace and floors	Provision of neat and clean, healthy environment where all employees enjoy their work
Seiketsu	**Standardise**	Maintenance of organisation, orderliness and cleanliness	Assuring the maintenance of previous 3S and prevention of workplace to become worse again in future
Shitsuke	**Self-discipline**	Constantly following the specified standardised procedures	Develop the proactive change in the behavior of employees for sustained 5S implementation

Table 1. 5S and its importance (Ho, 1999a)

The comparison of 5S frameworks provided by Hirano (1995), and Kobayashi, et al. (2008) has evaluated the differences of thinking process regarding the 5S in Japanese and western organisations. The Japanese organisations recognise 5S as a philosophy in Japan while western organisations take 5S as a technique or tool in the UK and USA. The fundamental fact of 5S is that it minimizes the cost by maximizing the effectiveness, efficiency, and performance through the sustainability of high-quality working environment (Liker and Hoseus, 2008). The implementation of 5S technique needs commitment from the top management and the bottom level employees of the organisations because it is a team-based process improvement tool for error proofing, safe and well-organised culture of the organisation (Brayer and Walsh, 2002).

Some western organisations still have the perception that 5S is just housekeeping practice (Chin and Pun, 2002). But 5S is far more than housekeeping. If it is successfully implemented, it assists to minimise waste, in process inventory, unplanned downtime, and improve the working conditions (Kobayashi et al., 2008). It is a systematic approach for managing the manufacturing operations with less human effort, capital, workspace, and timely delivery of defect free products to their customers (Chapman, 2005). Tice, Ahouse and Larson (2005) have proclaimed that 5S technique significantly contributes to crucial strategic priorities of every manufacturing organisation such as productivity, quality, costs, delivery, safety, and morale. A large number of researchers have proclaimed that 5S has significantly emerged as a support, foundation, starting point, and baseline of various organisational management techniques like lean thinking, ISO 9000, Six Sigma, Kaizen, TPM, ISO 14001, TQM, JIT, and continuous improvement (Hirano, 1996; Imai, 1997; Ho, 1999b; Bamber, Sharp, and Hides, 2000; Suárez-Barraza and Ramis-Pujol, 2012). However, this study investigates whether 5S has the ability to improve productivity in the automotive parts manufacturing sector. It explores the suitability of 5S as an appropriate tool for productivity improvement.

Hypothesis

The study is based on the following assumption:

H1: The implementation of 5S leads to productivity improvement in the automotive parts manufacturing companies.

H1o: The implementation of 5S does not lead to productivity improvement in the automotive parts manufacturing companies.

The following are sub hypothesis:

H2: An increase in machine downtime rate increases company productivity in the automotive parts manufacturing organisation.

H2o: An increase in machine downtime rate decreases company productivity in the automotive parts manufacturing organisation

H3: An increase in labour production output rate increases company productivity in the automotive parts manufacturing organisation.

H3o: An increase in labour production output rate decreases company productivity in the automotive parts manufacturing organisation

4. Methodology

The method for this research will be discussed under the following headings, namely: research design and approach, company that participated in the study, data collection, as well as the measurement and data analysis.

4.1. Research design and approach

This study was quantitative in nature. It examines the relationship of company productivity as a dependent variable to labour production output, as well as machine downtime. Bryman and Bell (2007) explain that the quantitative approach involves the use of statistical procedures to analyse the data collected. Consequently, after the measurements of the relevant variables, the scores were transformed using statistical methods. In addition, the study adopted a panel data analysis. According to Curwin and Slater (2002), panel data analysis is the statistical analysis of data sets consisting of multiple observations on each sampling unit. It contains more degrees of freedom and less multicollinearity than cross sectional data thus improving the efficiency of econometric estimates (Bryman and Bell, 2007). For this study, the pre-and post-5S data that were collected overtime from the automotive parts manufacturing organisation were analysed using the regression model. The study was also conclusive in design. Conclusive studies are meant to provide information that is useful in decision-making (Yin 2008).

4.2. Company that participated in the study

A convenience sample from one large automotive parts manufacturing organisation situated within the eThekwini District Municipality in the province of KwaZulu-Natal in South Africa was used. The company had adopted a 5S strategy and agreed to participate in the study. It had 1307 employees and operates a three-shift system. Table 2 presents a percentage breakdown of employees in terms of their level of activities.

Level of activity		Percentage
1.	Plant management	3.1
2.	Support administration staff	11.0
3.	Team leaders	5.2
4.	Line functional employees	80.7

Table 2. Percentage breakdown of employees in terms of their level of activities
Source: author's own analysis

4.3. Data collection

The collection of data from the company that participated in the study was carried out in two phases, that is, the collection of pre- and post-5S results by the Health and Safety team leader from the operational records relating to housekeeping. The data for labour production output and machine downtime were kept on the System, Applications and Products (SAP) version 6.0 data management programme. The collection of such data over time provided a greater capacity for capturing the complexity of 5S changes than using the one group post-test design that involves the collection of only the post-data after the changes have been implemented, resulting in threats to internal validity (Bryman and Bell, 2007). The validation of data from SAP programme was done by the researcher. This was achieved by comparing data from SAP with the documented data kept on files for accuracy.

This involved the collection of pre-and post-5S results from company records for both labour production output and machine downtime. The pre 5S results were quarterly data reflecting the company's performance over the two-year period prior to 5S implementation. This includes data from the first quarter of 2014 to the final quarter of 2015. The post 5S data reflect the company's performance for two years after 5S was implemented. This includes data from the first quarter of 2016 to the final quarter of 2017.

4.4. Measurement and data analysis

The company's quarterly time series data on labour production output and machine downtime were used. The measurements were based on a total of 64 observations. According to Westland (2010), there is no rule regarding the minimum number of observations for a balanced data panel. However, 50 observations are acceptable but more than 100 is recommended (Bryman and Bell, 2007). The regression model used was of the Ordinary Least Square (OLS) variety. The choice was influenced by data constraints. However, the model provided the statistical method that enabled the researcher to examine the relationship between the variables effectively.

A dummy variable which assumed the value of 0 and 1 to represent the pre and post 5S, respectively, was introduced into the ordinary least squares (OLS) model. The aim was to isolate the pre and post productivity effects. Consequently, if 5S proved to be a useful strategy in raising productivity levels, this would result in a statistically significant coefficient on the dummy variable.

The OLS model used was as follows:
$Productivity = B_o + B_1$ *labour production output* $+ B_2$ *machine downtime* $+ B_3$ *Pre/Post-Dummy.*

Where B_o is the constant
B = coefficient of the independent variables

The above model identifies productivity as a function of labour production output and machine downtime. Data was analysed using Statistical Package for Social Sciences (SPSS) version 25. It enabled the 5S data that was obtained, quarterly, over the multiple period time from the same operational division, to be appropriately analysed. Hence, the results provided the unbiased estimations (Yin, 2008). Furthermore, the OLS was based on the fixed effects model. The fixed effects is a statistical model in which the model parameters are fixed (that is, non-random quantities) (Curwin and Slater, 2002). Consequently, the variables were collected, quarterly, from the first quarter of 2014 to the last quarter of 2017 from the same company.

For the study to achieve its objectives, the normality test was conducted using Kolmogorov-Smirnov and Shapiro-Wilk for the overall score of the constructs. Table 3 present results for normality tests for labour production output and machine downtime.

	Kolmogorov-Smirnov[a]				Shapiro-Wilk		
	Group	Statistic	Df	Sig.	Statistic	df	Sig.
Labour production output	0	0.175	8	0.200*	0.879	8	0.084
	1	0.185	8	0.200*	0.915	8	0.248
Machine downtime	0	0.132	8	0.200*	0.935	8	0.437
	1	0.175	8	0.200*	0.952	8	0.668

*. This is a lower bound of the true significance
a. Lilliefors Significance Correction

Table 3. Normality tests for labour production output and machine downtime

Statistical tests in Table 3 revealed that the data were normally distributed ($p>0.05$). Hence the results were analysed using parametric test. That is, the t-tests.

5. Study results

This section analyses the results for pre-and post-5S means comparison, as well as productivity.

5.1. Pre- and post-5S means comparison

Table 4 compare means (in percentages) for labour production output and machine downtime.

No.	Variable	Pre-5S period (%)	Post-5S period (%)	% mean difference (pre – post)
1.	Labour production output	83.7	82.9	+0.8
2.	Machine downtime	4.3	3.0	+1.3

Table 4. Pre- and post-5S percentage means comparison
Source: author's own analysis

Table 4 indicates that the percentages mean data for pre-5S on labour production output and machine downtime is 83.7% and 4.3%; respectively. In addition, the percentage mean data for post-5S labour production output and machine downtime is 82.9% and 3.0%; respectively. The results shows an increase in mean values for labour production output and a reduction of machine down time mean values from pre-5S mean data to post-5S mean data. This indicates the influence of 5S in the organisation that participated in the study. Consequently, the next section 5.2 assesses productivity results as a consequence of 5S implementation.

5.2. Productivity results

Table 5 presents the results for productivity as a dependent variable to labour production output, machine downtime as well as post-5S dummy.

Regression	Coefficient	t-statistic	Probability
constant (B_0)	1.516	0.791	0.438
Labour production output	0.101	0.401	0.693
Machine downtime	-0.503	-2.162	0.043
5S dummy	-0.291	-1.062	0.301
R-squared	0.195	F-statistics	1.615
Adjusted R^2	0.074	Sum of squares	1.170
Standard Error of regression	0.491	Durbin-Watson stat.	0.650

Table 5. Results for productivity as a dependent variable to labour production, machine downtime, as well as post-5S dummy
Source: author's own analysis

Note: Regression data: 2014-2017 for 64 observations. The following OLS estimation is based on the equation:
Productivity = B_0 + B_1 labour production output + B_2 machine downtime + B_3 Pre/Post-Dummy.

5.2.1. Productivity as a dependent variable to labour production output

The results in Table 5 show that labour production output rate has no relationship to productivity. This is determined by its t-value of 0.401, which is below the critical t-value of 1.960 at the 5% level of significance (Curwin and Slater, 2002).

5.2.2. Productivity as a dependent variable to machine downtime

Results as illustrated in Table 5 show that machine downtime has a relationship and is statistically significant to productivity. This is determined by its t-value of -2.162, which is above the critical t-value of 1.960 at the 5% level of significant. The negative value indicates that an increase in productivity is a result of a decrease in machine downtime.

5.2.3. Productivity as a dependent variable to 5S dummy variable

Results show that 5S has no relationship to productivity. This is determined by its t-value of -1.062 and is below the critical t-value of 1.960 at the 5% level of significance, thus accepting the null hypothesis of relationship between these two variables. It has the adjusted R^2 of 0.074. However, the serial correlation is low at 0.650 when compared to the standard value of 1.73 at the 5% level of significance (Curwin and Slater, 2002).

6. Summary of results: Statistical tests and box plots

This section analyses data using factorial designs. It incorporates box plots to determine whether the factorial ANOVA assumptions of normality and homogeneity of variances have been met. Porkess (2005) explains that the populations represented should be normally distributed (that is, the normality), making the mean an appropriate measure of central tendency. However, the homogeneity of variance indicates that the population from which the data are sampled should have the same variance.

The Bartlett's test were also used to verify whether the variances were equal for all the samples (Curwin and Slater, 2002). The following Figure 1 shows the summary of the results from the Bartlett's test for homogeneity of variances.

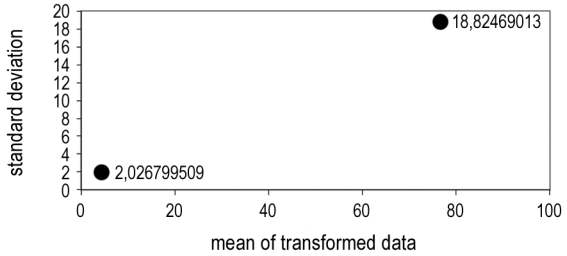


Figure 1. Bartlett's test for homogeneity of variances

Table 6 presents detailed results of Bartlett's test for homogeneity of variances for labour production output and machine downtime.

Variables	Means of transformed data	Standard deviations of transformed data	P-Value
Labour production output	77.231	18.825	2.060
Machine downtime	4.527	2.027	

Table 6. Bartlett's test for homogeneity of variances
Source: author's own analysis

The p-value in the Bartlett's test (at $p>0.05$) shows that the homogeneity of variance is violated. The p-value at 2.060 is above the significant level of 0.05. Therefore, the variances are not equal, given the amount of variability in the variances that can naturally occur in the data. The results are conformed by box plots in Figure 2.

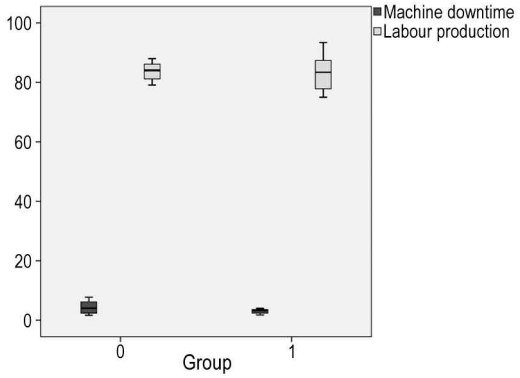


Figure 2. Box plots determining the normality and homogeneity of variance

Figure 2 shows that the mode of change from pre to post 5S period is homogeneous. However, the box plots indicates that the variances for machine downtime and labour production output are not equal. This was confirmed by Bartlett's test results.

7. Discussion

This study investigates the impact of 5S for the improvement of productivity in the automotive parts manufacturing company in South Africa. It examined the production and related experience of the parts manufacturing company that has adopted a 5S strategy within its processes. Quarterly time series data on labour production output and machine downtime were used to analyse data. Results from this study indicate that productivity has no relation to labour production output after the implementation of 5S. However, it revealed the relationship for machine downtime with productivity. Ishijima et al. (2016) indicated that the overall machine effectiveness in an industry requires a proper machine environment. This is achieved by maintaining the 5S systems in the machine surrounding. The availability, performance, quality rate and machine effectiveness of the plant will increment by implementing 5S practices (Randhawa and Ahuja, 2017).

8. Implications of results for policy and practice

Organisations in South Africa should revise their performance management system and develop 5S strategies, policies and practices that help to achieve new productivity goals and support organisational and cultural change (Khanna and Gupta, 2014). Besides the achievement of study objectives, the following conclusions can be made on the 5S philosophy:

1) It is system that assists to minimize waste and improve the working conditions.
2) It is the foremost technique required for the superior efficiency in the production and quality of products through waste elimination.
3) 5S implementation depends significantly upon certain human factors like employee commitment, training, competencies and sustainability initiatives (Ebadi et al., 2015).

9. Study limitations

The study was limited to an automotive parts manufacturing company within the eThekwini District Municipality. The investigation was conducted in a single company that has adopted 5S. As there are 378 registered automotive parts manufacturing companies in South Africa (SAinfo, 2016), the results cannot be extrapolated to other companies within the sector. Secondly, it did not examine the process followed during the 5S implementation including (amongst others) the individuals that participated in the implementation process. It only used quarterly time series data to determine the pre-and post-labour productivity effects resulting from 5S strategy. Lastly, the econometrics model used was of the OLS variety, solely due to data constraints. Future studies ought to use the more advanced Johansen VAR methodology or panel data analysis, both of which rely on large datasets.

10. Conclusion

Since its inception, the practice of 5S has been recognised as the base foundation for quality improvement programmes which significantly improve organisational working environment and industrial management processes (Ho, 1999a). Properly implemented and managed, the system has the ability to minimize waste and improve the working conditions. Consequently, the study revealed the relationship between machine downtime and productivity in the selected automotive parts manufacturing company after the 5S was implemented.

11. Future research required

During the course of this study, issues relating to the long-term survival of a 5S strategy after implementation were not covered. It is recommended that future research should examine the following issues in greater depth:

- when to use and when not to use 5S system;
- the applicability of a 5S approach to other industrial sectors;
- the process followed during the implementation of a 5S system; and
- a more comprehensive investigation should be carried out using a randomised sample of the registered automotive manufacturers that use 5S strategy to see if the results can be generalised.

The study investigated the impact of 5S in the automotive parts manufacturing organisation in South Africa. The pre- and post-5S quarterly data from company records were collected. It established that machine downtime has a relationship and statistically significant to productivity. However, productivity has no relationship with both the 5S and labour production output.

References

[1] Bamber, C.L., Sharp, J.M. and Hides, M.T. (2000). Developing management systems towards integrated manufacturing: a case study perspective, *Integrated Manufacturing Systems*, 11(7), 454-461.

[2] Becker, J. E. (2001). Implementing 5S: To promote safety & housekeeping, *Journal Professional Safety*, 46(8), 29-31.

[3] Bicheno, J. (1998). Your lean toolbox, *Control*, September, 10-11.

[4] Brayer, P. and Walsh, M. (2002). Facilitating change – implement 5S: An Australian case study, *Managerial Auditing Journal*, 17(6), 329-332.

[5] Bryman, A. and Bell, E. (2007). *Business Research Methods*. Oxford Press: USA.

[6] Chapman, C. (2005). 'Clean house with Lean 5S, *Quality Progress*, 38(6), 27-32.

[7] Chin, K.S. and Pun, K.F. (2002). A proposed framework for implementing TQM in Chinese organisations, *The International Journal of Quality & Reliability Management*, 19(3), 272-276.

[8] Conference Board (2015). *Productivity brief 2015: Global productivity stuck in the slow lane with no signs of recovery in sight*, Business World, New York.

[9] Curwin, J. and Slater, R. (2002). *Quantitative Methods for Business Decisions*. British Library Cataloguing Data: London.

[10] Dogan, Y., Ozkutuk, A. and Dogan, O. (2014). Implementation of '5S' methodology in laboratory safety and its effect on employee satisfaction, *Mikrobiyoloji Bulteni*, 48(2), 300-310.

[11] Ebadi, F., Safari, H., Habibi, F., Akbari, F. and Rezapour, A. (2015). Hospitals' readiness to implement clinical governance, International *Journal of Health Policy and Management*, 4(2), 69-74.

[12] Erdal, M. (2007). *5S system – Cleaning and Order management*, Available at www.meslekiyeterlilik.com (accessed 15 August 2017).

[13] Flynn, B., Schroeder, R. and Sakakibara, S. (1995). Relationship between JIT and TQM: practices and performance, *Academy of Management Journal*, 38(5), 1325-1360.

[14] Gapp, R., Fisher, R. and Kobayashi, K. (2008). Implementing 5S within a Japanese context: an integrated management system', *Management Decision*, 46(4), 565-579.

[15] Gao, S. and Lowa, S.P. (2014). The Toyota Way model: an alternative framework for lean construction, *Total Quality Management and Business Excellence*, 25(6), 664-682.

[16] Golroudbary, S.R. and Zahraee, S.M. (2015). System dynamics model for optimizing the recycling and collection of waste material in a closed-loop supply chain, *Simulation Modelling Practice and Theory*, 53(1), 88-102.

[17] Hartmann, E. (1992). *Successfully Installing TPM in a Non-Japanese Plant*, TPM Press, Allison Park, PA.

[18] Hirano, H. (1995). *5 Pillars of the Visual Workplace: The Sourcebook for 5'S Implementation*, Productivity Press, Tokyo.
[19] Hirano, H. (1996). *5S for Operators: 5 Pillars of the Visual Workplace (5S Shido Manual)*, Productivity Press, Tokyo.
[20] Ho, S.K. (1996). Japanese 5-S practice, *The TQM Magazine*, 8(1), 45-53.
[21] Ho, S.K.M. (1997). Workplace learning: the 5-S way, *Journal of Workplace Learning*, 9(6), 185-191.
[22] Ho, S.K.M. (1999a). *Operations and quality management*. New York: Cengage Learning.
[23] Ho, S.K.M. (1999b). 5-S practice: the first step towards total quality management, *Total Quality Management*, 10(3), 345-356.
[24] Ikuma, L.H. and Nahmens, I. (2014). Making safety an integral part of 5S in healthcare, *Work-a Journal of Prevention Assessment & Rehabilitation*, 47(2), 243-251.
[25] Imai, M. (1997). *Gemba Kaizen*, McGraw-Hill, New York, NY.
[26] Ishijima, H., Eliakimu, E. and Mshana, J.M. (2016). The '5S' approach to improve a working environment can reduce waiting time: Findings from hospitals in Northern Tanzania, *The TQM Journal*, 28(4), 664-680.
[27] Khanna, V.K. and Gupta, R. (2014). Comparative study of the impact of competency–based training on 5S and TQM: A Case study, *International Journal of Quality & Reliability Management*, 31(3), 238-260.
[28] Klein, N. (2012). *Real wage, labour productivity, and employment trends in South Africa: A closer look*, IMF WP/12/92, IMF Publishing, Washington, DC.
[29] Kobayashi, K., Fisher, R., and Gapp, R. (2008). Business improvement strategy or useful tool? Analysis of the application of the 5S concept in Japan, the UK and the US, *Total Quality Management and Business Excellence*, 19(3), 245-262.
[30] Kumar, M., Antony, J., Shingh, R.K., Tiwari, M.K. and Perry, D. (2006). Implementing the lean sigma framework in an Indian SME: a case study, *Production Planning and Control*, 17(4), 407-423.
[31] Liker, J.K. and Hoseus, M. (2008). *Toyota culture: the heart and soul of the Toyota way*. New York: McGraw-Hill.
[32] Mann, R. and Kehoe, D. (1994). An evaluation of the effects of quality improvements activities in business performance, *International Journal of Quality & Reliability Management*, 11(4), 29-44.
[33] Martı´nez-Lorente, A.R., Dewhurst, F.W. and Gallego Rodriguez, A. (2000). Relating TQM, marketing and business performance: an exploratory study, *International Journal of Production Research*, 38(14), 3227-3246.
[34] Merino, J. (2003). Quality management practices and operational performance: empirical evidence for Spanish industry, *International Journal of Production Research*, 41(12), 2763-2786.
[35] Monden, Y. (1998). *Toyota Production System: An Integrated Approached to Just in Time*, Engineering and Management Press, Norcross, GA.
[36] O'hEocha, M. (2000). A study of the influence of company culture, communications and employee attitudes on the use of 5Ss for environmental management at Cooke Brothers Ltd, *The TQM Magazine*, 12(5), 321-330.
[37] Osada, T. (1991). *The 5S's: Five Keys to a Total Quality Environment*, Asian Productivity Organisation, Tokyo.
[38] Patten, J.V. (2006). A second look at 5S, *Quality Progress*, 39(10), 55-59.
[39] Pheng, L.S. (2001). Towards TQM – integration Japanese 5S principle with ISO 9001: 2000 requirement, *The TQM Magazine*, 13(5), 334-340.
[40] Porkess, R. (2005). *Collins internet-linked dictionary of statistics*, HarperCollins, Glasgow.
[41] Randhawa, J.S. and Ahuja, I.S. (2017). 5S – a quality improvement tool for sustainable performance: literature review and directions, *International Journal of Quality & Reliability Management*, 34(3), 334-361.
[42] Sakakibara, S., Flynn, B.B., Schroeder, R.G. and Morris, W.T. (1997). The impact of just-in-time manufacturing and its infrastructure on manufacturing performance, *Management Science*, 43(9), 1246-1257.
[43] Sanchez, P.M., Rodriguez, C.M., Maruyama, U. and Salazar, F. (2015). Impact of 5S on quality, productivity and organisational climate – Two Analysis Cases, *Proceedings of the 2015 International Conference on Operations Excellence and Service Engineering*, Orlando, Florida, USA, September 10-11, 2015, IEOM Society, 748-751.
[44] SAinfo (2016). *South Africa's automotive industry*, viewed 14 October 2017, from http://www.southafrica.info/doing_business/economy/key_sectors/ motorindustryboost.html
[45] Sawada, N. (1995). *The Kaizen in Toyota production system*, CHU-SAN-REN Quality Control Course, Nagoya, 1-38.
[46] Shah, R. and Ward, P.T. (2003). Lean manufacturing: context, practice bundles, and performance, *Journal of Operations Management*, 21(2), 129-149.
[47] Srinivasan, S., Ikuma, L.H., Shakouri, M., Nahmens, I. and Harvey, C. (2016). 5S impact on safety climate of manufacturing workers, *Journal of Manufacturing Technology Management*, 27(3), 364-378.
[48] Suárez-Barraza, M.F. and Ramis-Pujol, J. (2012). An exploratory study of 5S: A multiple case study of multinational organisations in Mexico, *Asian Journal on Quality*, 13(1), 77-99.
[49] Sugiura, Y. and Gillespie, J.K. (2002). *A Bilingual Handbook on Japanese Culture*, 2nd ed., Natsume Books, Tokyo.
[50] Tice, J., Ahouse, L. and Larson, T. (2005). Lean production and EMSs: Aligning environmental management with business priorities, *Environmental Quality Management*, 15(2), 1-12.
[51] Venter, J. (2004). Guidelines for productivity consultation, *South African Bulletin*, 22:7.
[52] Willmott, P. (1994). *Total Productive Maintenance: The Western Way*, Butterworth-Heinemann, New York, NY.
[53] Yin, R.K. (2008). *Handbook of Applied Research*: California. Sage. Thousand Oaks.
[54] Young, F.Y.F. (2014). The Use of 5S in Healthcare Services: a Literature Review, *International Journal of Business and Social Science*, 5(10), 240-248.
[55] Zahraee, S.M., Hashemi, A., Abdi, A.A., Shahpanah, A. and Rohani, J.M. (2014). Lean manufacturing implementation through value stream mapping: a case study, *Journal Teknologi*, 68(3), 119-124.
[56] Zondo, R.W.D. (2018). The impact of gainsharing in the automotive parts manufacturing industry of South Africa, *South African Journal of Economic and Management Sciences*, 21(1), a1773. https://doi.org/ 10.4102/sajems.v21i1.1773.

The «New Format» Quality Management Systems at the Enterprises of the Russian Industry

Tatyana ANDREEVA [1*], Marina YASHINA [2], Nikolay YASHIN [3], Natalia EFREMOVA [4], Tatyana CHERNYSHOVA [5], Karmah Ahmed Naji HAMEED [6]

[1] Grand PhD in Economics, Professor Department of Management Theory and Business Technologies, Plekhanov Russian University of Economics, Moscow, Russian Federation; E-mail: andreevata726262@mail.ru
[2] Ph. D., Associate Professor of management, Socio-Economic Institute Yura Gagarin State Technical University of Saratov, Russian Federation; E-mail: myashina@mail.ru
[3] Grand PhD in Economics, Professor Department of Management, Socio-Economic Institute Yura Gagarin State Technical University of Saratov, Russian Federation; E-mail: yashin@ssea.runnet.ru
[4] Ph. D., Associate Professor of management, Socio-Economic Institute Yura Gagarin State Technical University of Saratov, Russian Federation; E-mail: raiznali@mail.ru
[5] Assistant, Department of Management Theory and Business Technologies, Plekhanov Russian University of Economics, Moscow, Russian Federation; E-mail: Chernyshova@niigaz.ru
[6] Assistant, Department of Management Theory and Business Technologies, Plekhanov Russian University of Economics, Moscow, Russian Federation; E-mail: karmah2017@yandex.ru
[*] Corresponding author

Abstract

The implementation of the new requirements of the ISO 2001-2015 standard has become a priority for modern industrial enterprises. The quality management system is becoming closer to real business: it is transforming from a system of rules for controlling product discrepancy, corrective actions, internal audits, documentation and records to the business management system as a whole. The dissimilarity of positions and the conniving attitude of the management of many enterprises to the use of scientifically based methodological approaches in management practice determine the need to create comprehensive methodological approaches that integrate strategic analysis methods and quality management methods to achieve the best results in creating "new format" quality management systems.

Keywords: *quality management; strategic management; integration; organization environment; risks and opportunities; stakeholders.*

1. Introduction

In modern business quality management and its ideology is an important factor in obtaining competitive advantages. Enterprises with a certified quality management system are gaining increasingly strong positions, which determines the mandatory inclusion of quality management in standard management tools. But as practice shows, the created QMS demonstrate a relatively weak orientation towards obtaining strategic effects. Quality management is a specialized activity, which is limited by the framework of production processes. The QMS usually has tactical operational goals, which are associated with ensuring the quality of products to effectively achieve the economic results of the enterprise. And although the scientific developments of modern scientists and practitioners constantly emphasize the need for significant changes in the general management system of an enterprise, in practice quality management systems are most often presented as local systems limited by specific functional tasks [1].

2. Trends in the development of quality management

Significant changes in quality management have occurred with the release of a new version of the international standard ISO 9001-2015. The new standard focuses on the process approach to management, establishes requirements for the analysis of the enterprise context, introduces the concept of risk and provides a procedure for identifying and assessing risks during the functioning of the enterprise quality management system. Such significant changes in the requirements for the quality management system actualized the tasks of developing scientific and practical recommendations for creating "new format" quality management systems focused on organization knowledge, leadership, a process approach and a clear vision of their strategic prospects. At the same time, there is a need to create a system that integrates the most effective approaches and methods of related management areas – quality management and strategic management [2].

The construction of a "new format" quality management system requires a thorough study of its basic elements. There should be a clear linkage of the organization's processes to the implementation of the strategic goals of the enterprise through analysis of the context of interests of all stakeholders, risk assessment and the implementation of continuous improvement processes. However, quality management more often plays the role of one of the local control systems and does not go beyond its functional tasks. The best results can be achieved if there are several management systems, as a result of which a synergistic effect from a qualitatively new management system can be obtained. Therefore, today the task of multi-aspect integration of

strategic management and quality management due to the intersection of problem areas of activity is particularly relevant. These problem areas are: analyzing the organization's environment, managing risks and opportunities, taking into account the requirements of all stakeholders, focusing on the organization's processes and knowledge, implementing continuous improvement, etc. All these elements are introduced as additional requirements in the new version of GOST R ISO 9001-2015 and suggest the implementation of new activities for the organization and its QMS. But despite the fact that the transition to the new version of the standard took place in 2016, at the moment many enterprises have just begun the process of their development and implementation. Let us elaborate on some of them [3].

3. Current requirements of GOST R ISO 9001-2015

Understanding of the organization and its environment (paragraph 4.1). The operation of the quality system depends on changes in the environment in which it exists. The new requirements of ISO 9001-2015 oblige the organization to constantly monitor changes in the external and internal environment to ensure that these changes are taken into account in the work of the quality system and processes of the organization. By implementing this requirement, a link between the organization's development strategy and the quality system will be established. Thus, the QMS becomes a tool for strategic development. To fulfill the requirements, it is necessary to develop a systematic approach to the analysis and monitoring of external and internal factors (organization context). There are many methods to determine internal and external factors. The decision on whether to choose one method or another depends on the type and size of the organization. The main tools that are recommended for use are SWOT- and PEST-analysis [4].

The standard does not establish a direct requirement to document the results of analysis and monitoring of information about the external and internal environment of the organization. But it is impossible to analyze without documenting the results. The documents must provide the factors that influence the organization and its quality system and the results of the analysis of the influence of factors on the organization. Such information may be reflected in the following documents: strategic development plan; development concept; company business plan; mission and strategic goals of the company.

Understanding the needs and expectations of stakeholders (paragraph 4.2). There was no similar section in the previous version of the standard. In accordance with this new requirement, the identification of stakeholders and their requirements is necessary for the construction and operation of the quality system, its processes and risk and opportunity management.

The organization should determine the degree of influence of stakeholders on its activities and on the organization's ability to produce products of appropriate quality and on the performance of the system as a whole. Then it should manage relations with it in accordance with this. Such monitoring should be carried out regularly. It is not necessary to document this information, but nevertheless, it should be defined in the organization's documents, because it has influence at the work strategy and quality system. In addition, it is problematic to track changes in requirements without documentation. Information on the composition of stakeholders can be presented in a business plan, development concept, or other strategic documents [5].

The main tool that can be recommended to organizations for the implementation of this requirement is a stakeholder map, which expertly evaluates the "importance parameters" of stakeholders. An analysis of the interests of stakeholders and management of its impact on a business or a project will help in development of an optimal strategy of interacting with it.

Determining the scope of the QMS (paragraph 4.3). A key factor in the effectiveness of an organization's QMS is the accurate determination of its scope. It is important to take into account the analysis of the context of the organization and the interests of all stakeholders, as well as the type of product. The requirement is considered fulfilled if the boundaries of the QMS and the activities covered by it are clearly defined. You can document this information in the quality manual or in a separate document.

The evidence of fulfilling this requirement will be clear line between the quality management system and the activities covered by it, available in the form of documented information in the quality manual or in a separate document.

Leadership (paragraph. 5). The new version of the standard significantly changes the approach to determining the role of leadership from passive to active. All initiatives related to the development and operation of a quality system should come from senior management.

The task of leaders is to, through their actions, exert not administrative, but psychological and social influence on subordinates.

The actions of senior management should stimulate the internal motivation of employees to fulfill the requirements of the quality system.

Now it is no longer necessary to appoint a representative of the quality manual specifically, because the responsibility for the QMS is taken by the management. The seniors demonstrate leadership in leading the organization to long-term success. Such innovations require serious changes in the way of thinking. The development of quality policies and goals is one of the responsibilities of senior management. The quality policy can be considered the "face" of the organization, because it briefly expresses the essence of the company.

All provisions of the quality policy should be thought out and supported by particular actions, and related to strategic directions of activity.

Top management is obliged to convey to employees their duties, responsibilities and authority to perform the respective functions. The standard requires that each employee knows and understands his duties, assumes responsibility and has the authority to carry out the tasks.

The proof of implementation will be the promotion of leadership at all levels of the organization, the creation of an inspiring environment, which consists of politics, communication culture, recognition of the contribution of people, the provision of resources for training, etc.

Actions regarding risks and opportunities (paragraph 6.1). In the new version of the standard, a key change, which is associated with the organization of risk management activities, has occurred. In accordance with it, the organization must determine and take into account risks and opportunities and their impact on processes. The standard does not require the use of a specific method for assessing risks and opportunities, but as a result of work there should be proposals and actions to respond to risks. The evidence of the implementation of this type of activity may be a plan or action for the identified risks and opportunities [6].

Process approach (section 0.3, paragraph 4.). The standard reinforces the position on the application of the process approach in the development, implementation and improvement of the effectiveness of the quality management system in order to satisfy the interests of all interested parties. The implementation of the process approach involves the definition, systematization and management of processes and their interaction based on performance indicators to achieve the results established by the Quality Policy and the strategic direction of the company's development. The processes and their unified system should be managed using the cycle of continuous improvement of PDCA. The prevention of unwanted risks and the use of opportunities should also be taken into account.

Quality objectives and planning for their achievement (paragraph 6.2). The emphasis in the implementation of this process for setting goals is placed on their compatibility with the strategic direction of the organization and their implementation.

When planning activities to achieve quality goals, enterprises must determine the resources, those responsible, timing, evaluation criteria. The evidence of meeting this requirement may be a plan that includes information on the above criteria.

Knowledge of the organization (paragraph 7.1.6). The main factor in the competitiveness of modern business is information and knowledge. For the first time, a standard for a quality management system contains requirements. This fact is reflected in the standard GOST R ISO 9001-2015 – for the first time in the standard for a quality management system there are requirements for the organization's knowledge management, according to which the organization must determine what knowledge it has, assess its knowledge needs for organizing the functioning of processes. An organization is required to develop mechanisms to preserve and prevent information. The standard does not establish specific criteria for what is considered knowledge. It only gives examples of sources of knowledge. The organization can independently establish the types of knowledge that it needs, and determine measures of managing its knowledge. Some companies consider data from previous projects as knowledge; others, regulatory and technical documentation or a company library; third, any information. To manage knowledge, company needs to document the information. If it is not documented, then it is too likely that knowledge will be lost and will not be transferred to interested employees of the organization.

Documented information (paragraph 7.5). The term "documented information" is introduced in GOST R ISO 9001-2015 and covers the currently known terms "document" and "record". There are no requirements for using the terminology common to GOST R ISO 9001-2015 in the QMS, which means that the use of terminology customary for the organization can be continued without changes. Nevertheless, the transition is an ideal moment for reviewing the QMS documentation and its optimization using modern technological capabilities.

Functioning (section 8). With regard to the requirements for the process of designing and developing products and services (paragraph 8.3), additional requirements that need special attention have been introduced: planning, input and output data, controls, change management, including actions to prevent adverse effects. The critical point is the storage of documented information as evidence of the main activities in this process. An increase in the level of detalization is necessary in order to ensure the integrity of the process in accordance with the requirements.

The revised ISO 9001 focuses on processes, products and services supplied by external suppliers (paragraph 8.4). It is necessary for the organization to determine the type and extent of control on the processes performed by suppliers and provide them with relevant information.

Senior managers' review (paragraph 9.3). Changes are associated with the inclusion of additional input. The analysis should consider external and internal factors (organization context), feedback from stakeholders, monitoring and measurement results, the activities of external suppliers, the use of resources and the effectiveness of actions in relation to risks and opportunities. Proof of meeting these requirements will be documented information on the results of management reviews, usually in the form of a protocol or report.

Improvement (paragraph 10). The section has been amended to include non-compliances and the exclusion of preventive actions. The idea is that the quality management system itself with the processes of managing risks and opportunities introduced in it plays the role of a preventive measure, i.e. preventive actions. Improvements are aimed at improving products and services, eliminating, preventing or reducing unwanted effects and improving the effectiveness and efficiency of the QMS. Changes will require a review of procedures for managing non-compliances, corrective and preventive actions.

Thus, the new requirements of the standard affect the strategic aspects of the organization one way or another. In the process of continuous improvement of the enterprise, to solve both operational and tactical tasks, and to implement the mission and policy in the field of quality, it becomes necessary to integrate strategic management with a quality management system based on process management.

At the same time, almost all ISO international standards indicate common elements of management systems that should be managed in a unified manner, based on an integrated approach. This may explain the desire to create a unified integrated management system.

An undoubted priority in its development will be the recommendations of the ISO 9001-2015 standards "Quality Management System. Requirements" and GOST R ISO 9004-2010 "Management to achieve sustainable success of the organization. The approach based on quality management" [7,8].

4. Integration of quality management and strategic management

However, these days there are no proven mechanisms for interaction between the quality management system and the strategic management system of the enterprise. Unified integration principles have not been formulated, industry characteristics have not been taken into account, and the principles of quality management have not been adapted to them. In the end, the integrity of the management system is violated, which is expressed in inconsistent management decisions and negatively affects the quality and competitiveness of products, services and enterprises in general, makes financial performance worse, and violates the rhythm of sustainable development.

Each management area is characterized by specific goals and objectives, there are many overlapping elements, processes, areas of activity and areas of functioning. For each of them, the priority of consideration of environmental factors is important, and the conquest and retention of competitive advantages are means of achieving strategically significant results [9].

Standards of ISO 9000 should be the organizational and methodological foundation for integration of strategic management and quality management. This is due to the fact that the basic concepts and principles formulated in them are most consistent with the concepts and principles of general and strategic management. In that case, the process approach, which realistically, and not indirectly (as a functional approach) reflects the processes carried out in modern business, is especially important.

In accordance with the proposed recommendations for the integration and adaptation of the existing quality management system to the new requirements of the standard, we have developed a model of the company's quality management system

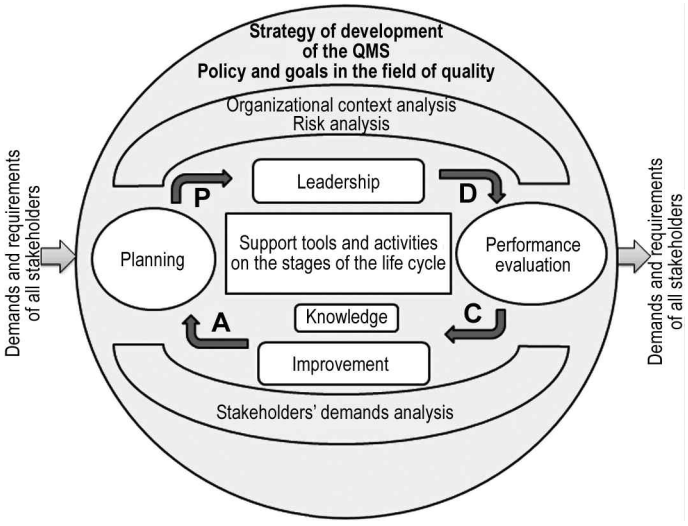


Figure 1. Model of the "new format" quality management system integrated with the strategic management system.

of the "new format". It is integrated with the strategic management system, which implies the development of a strategic direction of development based on the study of the organization's environment, the interests of all stakeholders, as well as risk and opportunity management, focused on the organization's knowledge, leadership, process approach to management and continuous improvement. We propose a model of such a system in the form of a scheme in which quality management processes, based on the process approach and the basic principles of quality management, are embedded in the strategic management system model, which also includes an analysis of the organization's environment, risk management, opportunities and taking into account the requirements of all stakeholders [10].

5. Conclusion

Thus, in the "new format" quality management system, for the effective functioning and achievement of goals set for the long term, it is necessary to integrate the related areas of management (strategic management and quality management) and to integrally use the specific methods and tools to achieve a synergistic effect. The applied management concepts should contribute to the development and most beneficial use of unique competitive advantages, including through the production of original management technologies based on the integration of related management concepts. It is such systems that integrate interacting and interrelated processes that make up the essence of the activities of enterprises, direct the work of units to achieve the main goal of the business – making a profit by meeting the requirements and expectations of all interested parties. This ensures effective management of all aspects of the enterprises (strategic planning, personnel management, quality management, financial management, etc.) and, as a result, the competitiveness of products and the enterprise as a whole increases.

Acknowledgement

The research have been financially supported by the Federal State Budget Educational Institution of Higher Education named after G.V. Plekhanov within the research project "The Mechanism of Adaptation of the Quality Management System of Russian Industrial Enterprises to the Requirements of International Standards during the Transition to the 6th Technological Order" (Protocol of the meeting of the Scientific and Technical Council of the Federal State Budget Educational Institution of Higher Education "Russian University of Economics named after G.V. Plekhanov" No. 3 dated 03/01/2018).

References

[1] Gugelev A.V., Andreeva T.A., Popova L.F. (2017). Quality management tools of industry standards // *Bulletin of quality*. No. 2(137). pp. 43-48.
[2] Nemtsev A.D., Glukhova L.V. (2017). Some approaches to assessing the competitiveness of integrated production structures // *Bulletin of the Volga University named after V.N. Tatishchev*. Vol. 1. No. 1. pp. 58-65.
[3] GOST R ISO 9001-2015. *Quality Management System. Requirements.* Standartinform, 2015. pp. 5-16.
[4] Yashin N.S., Andreeva T.A. (2017). Understanding the context of the enterprise within the quality management system // *Bulletin of the Saratov State Socio-Economic University*. No 3(67). pp. 115-124.
[5] Andreev A.V. (2018). A risk-based approach to supplier evaluation within the quality management system // *Bulletin of the Saratov State Social and Economic University*. No. 2(71). pp. 45-52.
[6] Popova L.F. (2017). The implementation of risk management in the enterprise quality management system // *Bulletin of the Saratov State Socio-Economic University*. No. 5. pp. 104-109
[7] GOST R ISO 9001-2015. *Quality Management System. Requirements*. Standartinform, 2015. pp. 5-16.
[8] GOST R ISO 9004-2010. *Management to achieving sustainable success of the organization. Quality management based approach*. Standartinform, 2011. pp. 5-10.
[9] Popova L.F. (2014). Assessment of the influence of environmental factors of the enterprise on the characteristics of the organizational structure // *Bulletin of Volgograd State University*. Series 3: Economics. Ecology. No. 2. pp. 53-63.
[10] Andreeva T., Popova L., Yashin N., Zhulina E. (2018). Integration of strategic and quality management in oil and gas companies of Russia // *Quality-Access to Success*. Vol. 19. No. 163. pp. 81-84.

Comparison of the ESG Guidelines Used in the European Higher Education Sector with the Principles of the ISO 9001:2015 Quality Management Standard

Roland SCHMUCK

Assistant professor, University of Pécs, Faculty of Business and Economics, Pécs, Hungary
E-mail: schmuck.roland@ktk.pte.hu

Abstract

The use of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) is replacing the ISO 9001:2015 in the European higher education sector. There are numerous challenges in implementing the ESG at the higher education institutions. This study reveals the similarities and the differences of the ESG guidelines and the ISO 9001:2015 principles. The methodology used is pairing the ESG guidelines with matching ISO 9001 principles. The outcome of the study shows that all of the ISO 9001 principles are included in the ESG, but only seven out of ten ESG guidelines are included in the ISO 9001 principles. Those guidelines which cannot be matched are specialized for the higher education sector. The study can help in the introduction of the ESG for institutions with experiences with the ISO 9001 standard.

Keywords: *quality management; higher education; ESG; ISO 9001; guidelines; principles.*

1. Introduction

Standardization facilitates the operation of organizations and business transactions because the relevant standard can be referenced instead of adding complex descriptions of a product or a service. This causes that organizations operating by widely accepted standards can reach competitive advantage (Petőcz & Szabó, 2003) Fitting this trend, higher education institutions are increasingly recognizing the importance of quality management systems (Barraquio, 2018), which should become an integrated part of the organization (Balashova & Gromova, 2017).

The topic of this study is relevant because many higher education institutions in the European Union are currently introducing or will soon introduce the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) standard due to accreditation requirements (ESG, 2015). The quality management systems of higher education institutions are becoming more and more unified. This should lead to quality improvements in the European higher education sector. At the same time, institutions are facing a number of new challenges while implementing the ESG standard.

The aim of the current study is to examine the ESG quality management system guidelines and compare them with the principles of the ISO 9001:2015 quality management standard.

The methodology of the research is to analyze the internal quality management guidelines of the ESG and check if they can be corresponded to the principles of the ISO 9001:2015 quality management system.

The research can be utilized by higher education institutions that are in the transition process from the ISO 9001:2015 quality management system to the ESG or operate these two quality management systems in parallel.

2. Quality at higher education institutions

Quality is a key issue in education. Traditionally this can be divided into two main aspects: the efficiency of teaching and the knowledge of graduates (Crombag, 1978). Using this approach, it is clear that the quality of education is largely determined by other factors, such as the supportive, administrative processes and infrastructural capabilities (Bedzsula, 2015).

From the 1990s a growing pressure can be seen on higher education institutions to become market-orientated. There have been several different approaches to increase quality in this sector. European institutions either implemented the ISO 9001 quality management system or a system based on the European Framework for Quality Management (EFQM) (Houston, 2008). The ISO 9001 system uses external agencies and requires extensive documentation. On the other hand, TQM-based systems may be time consuming and subjective in scoring (Srikanthan & Dalrymple, 2007). TQM was originally developed for businesses and this causes issues in its implementation at higher education institutions. This resulted in abandoning this philosophy in the education by many institutions (Green, 2007). Different quality management systems can be used at the same time in one organization, however it is suggested that these systems should be integrated to a unified enterprise management system (Andreeva et al., 2019). In any of these ways, the processes of the organization are standardized. One of the earliest implementation to reach customer satisfaction are the widely used student-surveys. Student satisfaction is one of the most important determinant of program value so universities place great emphasis on this area (Sutherland et al., 2019).

3. The ISO 9001:2015 quality management standard

There are many standards and methods of quality management. The widest-used general quality management system in Europe is the ISO 9001:2015, but in addition there are a number of industry-specific quality management standards as well. The use of a quality management system based on the ISO 9001:2015 quality management standard (referred as ISO 9001

from now on) is widely accepted in many sectors, including in the higher education.

In the 1970s, ISO began issuing international standards. The ISO 9001 was introduced in 1987 (Siva et al., 2016). Since the 1980s, more and more industry-specific standards were developed. Today, approximately 40% of the European standards are based on ISO standards (Schmuck, 2010). Applying the ISO 9001 standard results in learning intervention inside the organization (Castka, 2018). The ISO 9001 quality management standard is a general quality management standard, which is advantageous as it can be used by any organization. However, its disadvantage comes from its general nature, it lacks specialization to the individual needs of different industries. The European Union created the ESG which is specialized for the higher education sector.

The ISO 9001 standard is based on seven principles. The purpose of the principles is to improve the quality of the organization in accordance with the criteria defined by the standard. The principles are the following (ISO, 2015):

1. *Customer focus:* Organizations depend on their customers, so it is important to understand the needs of current and future customers, meet and strive to exceed their requirements and expectations.
2. *Leadership:* Leaders on all levels of the organization should create the unity of goals. They should also create and maintain an internal environment in which employees can participate in achieving the goals of the organization.
3. *Engagement of people:* The essence of the organization is their employees at all levels. The involvement of employees allows them to use their capabilities to create value.
4. *Process approach:* The desired result can be achieved more effectively and efficiently if the activities and the resources associated with them are treated as processes. Unlike before 2015, the ISO 9001:2015 standard also includes the systems approach in this principle, which was previously a separated principle (Certop, 2015). The essence of the systems approach is to identify, understand and manage the interconnected processes as a system, which contributes to the organization achieving its goals.
5. *Improvement:* Continuous improvement of the entire operation of the organization should be a constant goal of the organization.
6. *Evidence-based decision making:* Decisions should be based on the analysis of data, facts and other available information.
7. *Relationship management:* The organization and its suppliers are interdependent, and their mutually beneficial relationship enhances the value-creating capacity of both.

There is a significant relationship between TQM and ISO 9001 principles, as a general adoption of TQM principles was done at issuing the by ISO 9001:2000 standard in year 2000 (Dellana & Kros, 2018).

4. Comparison of the ESG guidelines with the ISO 9001:2015 principles

At the Lisbon Summit in 2000 the Member States of the European Union decided to work more closely together on creating a single European education area (OFI, 2011). The first version of the ESG was accepted in Bergen in 2005 (ESG, 2005). The currently used version was accepted in 2015 (ESG, 2015). As the first edition took place in Bergen, the ESG is often referred as the Bergen directives, despite the fact that the current ESG 2015 version was released in Brussels. The ESG aims to develop the European Higher Education Area (EHEA). The ESG guidelines provide guidance to higher education institutions to improve their quality. The higher education institutions in the countries of the EHEA are very different by size, organizational structure, functions and geographical location, the ESG uses general guidelines that can be used in such a diverse system. With generalization, the ESG accepts the autonomy of higher education institutions and the specificities of educational areas. (OFI, 2012) Although the ESG clearly states its guidelines, it does not exactly state how to fulfil them giving freedom to the institutions when applying the ESG. The general nature of ESG is similar to the ISO 9001 standard. However, ISO 9001 can be used in diverse industries, ESG is only helpful in the higher education sector. The ten ESG guidelines are discussed below and compared to the ISO 9001 principles. In each of them the ESG guideline is described briefly.

4.1. Policy for quality assurance

Regarding to the ESG institutions should have a publicly available quality policy, which should be in line with their institutional strategy. The quality policy has to developed internally but external stakeholders should be involved in the development process. The quality policy should emphasize the quality culture of the organization and should reflect the two main areas of higher education institutions: teaching and research. The implementation and monitoring of the quality policy should be done by the institution itself. This can be considered as a very general approach to quality policy. This ESG only generally suggest the content of the quality policy, which can be very different in individual realizations (Manatos et al., 2017). Quality policy should become an essence in the life of the institution (Rezenau, 2011) and should be generally known at all levels of the organization (Randhawa & Ahuja, 2018). The key of the successful implementation is in the quality-oriented organizational culture, which is needed for facilitating changes (Todorut & Bojincă, 2013, Hebbar & Mathew, 2017). A research on quality policies of British, German, Austrian and Hungarian high-ranked universities revealed that only 16.7% of them had transparent, publicly available quality policies (Benke et al., 2019).

According to the ISO 9001 quality management system, organizations need to have a quality policy and also have to set quality goals. These goals should be derived from the quality policy (Illés et al., 2017). As a Romanian case shows when adapting the ISO 9001 quality management system at universities, first the quality policy has to formulated following by quality objectives, the quality manual and descriptions of the operational processes (Moldovan, 2012). The quality policy and the quality objectives have to be clearly communicated to stakeholders. The “Policy for quality assurance” ESG guideline is included in the ISO 9001 “Leadership” principle because both of them are about the goals and objectives of the organization.

4.2. Design and approval of programs

This ESG guideline requires that institutions should have the necessary processes for planning and approving their educational programs. Programs should be designed in accordance with the objectives, including the learning outcomes. Institutions should state and communicate the outcome qualifications of their programs. They should provide transferable knowledge and skills to the students for their personal development and career. Programs should be in line with the strategy of the institution. Students and stakeholders should be involved in the development process. Programs should be approved through a formal institutional approval process.

The origins of the process approach can be traced back when the process characteristics approach replaced the product characteristics approach (Castello et al., 2020). Processes are very important in current quality management systems. The ISO 9001 requires defining the key operational processes to help organizations in improving their processes. The processes should be described standardized and uniform. Processes need to be identified and properly managed (Tănase & Velica, 2015). They should be repeatable and documented (Benner & Veloso, 2008). According to a study this can lead enhanced performance in project organizations (Din et al., 2011). The complexity of the processes affects the intervention possibilities at audits

(Castka & Balzarova, 2018).

The "Design and approval of programs" guideline can be interpreted as a special case of the "Process approach" of the ISO 9001 standard. While the ISO 9001 is very general about the processes, the ESG highlights one very important process in the higher education sector: the design and approval of programs.

4.3. Student-centered learning, teaching and assessment

Institutions using ESG should ensure that their programs encourage the active participation of students in the previously mentioned two guidelines. Students should take an active role in the creation of the learning process. Higher education institutions should respect student diversity and should have flexibility in learning paths and pedagogical methods. Teaching should be evaluated regularly. There should be predefined processes for managing student complaints.

There are debates about who is the customer of the higher education. While commonly it can be stated that the customer is the student (Jain et al., 2011), there are other approaches as well (Bedzsula, 2015). Vauterin et al. (2011) argue that the customers are future employers. Employees and administrative staff can also be considered as customers (Sunder, 2016). Some researchers state that quality can be judged by all stakeholders of the education (Veress, 1999).

It is generally accepted that universities should shift from product-led to customer-led approach (Angell et al., 2010). There are several different methods to measure the quality and customer satisfaction in higher education, such as the HEdPERF scale, the ECSI model (Sultan & Hong, 2010) or student satisfaction surveys. Shu et al. (2019) distinguished 20 factors in 4 groups in satisfaction of the university-industry cooperation. Jain et al. (2011) identified two primary dimensions in student satisfaction: program quality and quality of life. Using new pedagogical methods, such as gamification or new technologies can enhance student interest and motivation (Dovleac et al., 2019).

The "Student-centered learning, teaching and assessment" ESG guideline is very similar to the ISO 9001 "Customer focus" principle. While the ISO 9001 does not give a detailed guidance, the goal to reach customer satisfaction is the same in both cases. To be able to make this as a match between the ESG guideline and the ISO 9001 principle, we have to accept the mainstream opinion, that the customer of the higher education institutions are their students. Students are not only customers, but suppliers as well (Sunder, 2016, Foster, 2017), so the "Relationship management" ISO 9001 principle is also part of this ESG guideline. However, while the ISO 9001 principle concerns all suppliers, the ESG only cares students, not other suppliers.

4.4. Student admission, progression, recognition and certification

In the title of this ESG guideline the four main phases of student "life-cycle" appears. There should be predefined regulations of these processes. These should be made publicly available, implemented consistently and transparently. Information on student progression needs to be collected, monitored, and if needed, the necessary activities have to be done. Student work recognition is an important issue. The ESG specifies the use of the Lisbon Recognition Convention (1997), which made a strong boost in the international recognition of qualifications (Manatos et al., 2017). The recognition of qualifications internationally results in comparable standards and conformity for the labor market (Lapina et al., 2016). Recognizing students' work in other areas are important as well. A research shows that when students are involved in quality assurance procedures, their work should be recognized officially (Mourad, 2013).

This ESG guideline is very specific for the higher education sector. It does not comply with any of the ISO 9001 principles.

4.5. Teaching staff

Regarding to the ESG teachers should be competent and institutions should use fair and transparent recruitment processes. The teaching environment should be supportive, so teachers can do their work effectively. Higher education institutions should provide possibilities of professional development and have to strengthen the connection between teaching and research. They should encourage innovative teaching methods. An UK business school survey with over 25000 responses concluded that virtual learning environment is the third most important element specified in student satisfaction (Sutherland et al., 2019). A Polish research recommends to have internal marketing among the staff focusing on quality assurance in order create a quality culture (Mourad, 2013). Quality problems should be solved involving the staff (Nelyubina et al., 2016), which is the most valuable asset in higher education (Sunder, 2016). The lecturer can be considered as one of the most important dimension of quality (Hill et al., 2003).

The "Teaching staff" guideline of the ESG fits the ISO 9001 "Engagement of people" principle. However, the ESG guideline is narrower, as it mentions only teachers, while the ISO 9001 covers all working staff at the organization. At higher education institutions this means that this ESG guideline does not cover the administrative staff. An issue can arise from this perspective. The administrative staff is not involved in designing the quality assurance system, but they are needed in the implementation, which can negatively affect the organizational culture (Mourad, 2013).

4.6. Learning resources and student support

ESG requires that higher education institutions should allocate adequate funding and resources to support learning and teaching activities. These resources can be physical resources, IT infrastructure and human support. The quality assurance system should ensure that the resources are accessible to students and they can reach them. The administrative staff is responsible for support activities.

There are different views on the connection of learning resources and student satisfaction. Several studies show that the general category of student resources has only moderate effect on student satisfaction (Sutherland et al., 2019). Some state that the problem is in making proper use in these resources by the students (Hewitt & Clayton, 1999). Hill et al. (2003) found that student support is one of the most important dimension of quality in higher education.

This ESG guideline is unique in its nature as it is specialized to the higher education sector. Learning resources and student support are not mentioned by the general ISO 9001 standard. These can be somewhat considered as needed for customer satisfaction, but giving the exact guideline of ESG they cannot be obviously connected to any ISO 9001 principle. So the content of this ESG guideline is not part of the ISO 9001.

4.7. Information management

This ESG guideline is about decision making based on proper information. Institutions should ensure the collection, analysis, and utilization of relevant information for effective program and activity management. Institutions should collect and manage data about key performance indicators, students, satisfaction, learning resources, student support and career paths. Information management can be considered as a leadership role (Trivellas & Dargenidou, 2009). In practice, data is collected in processes and they are used to make decisions in another part of these processes, or other processes (Kozma, 2013). A study conducted in Jordan reveals a potential problem

with centralizing decisions instead of involving stakeholders (Al-Fuqaha, 2014). This can be considered as an important issue in Europe as well. Faculty management should include the staff in decision making as well (Green, 2007).

Overall, quality management systems enhance the decision making processes (Rodríguez-Mantilla et al., 2020). The ISO 9001 standard also contains this approach, where it is called "Evidence-based decision making". This is the ISO 9001 principle which equals the "Information management" ESG guideline.

4.8. Public information

ESG requires higher education institutions to publish information on their activities, including their programs, selection criteria, learning outcomes, teaching and assessment procedures, pass rates and learning opportunities. All of these information should be publicly available. Providing students with accurate information is very important (Mourad, 2013). The national quality insurance systems enhance this process (Mause, 2010).

This guideline is specific to the ESG, as companies are not required to operate publicly, so ISO 9001 does not require anything in this regard, however, it does not prohibit it.

4.9. On-going monitoring and periodic review of programs

According to the ESG institutions should continuously monitor and periodically review their programs in order to monitor the achievement of their objectives, the satisfaction of their students and meeting the needs of society. The review should consider the content of the program in light of the newest research results. The periodic reviews lead to the continuous development of programs. The actions planned or already taken have to be communicated to all concerned including their results. As higher education institutions are in competition with each other, they should continuously improve their programs to attract more students (Man & Kato, 2010). Constantly questioning whether the programs are reaching the expected outcomes is the base of the review process (Redmond et al., 2008). Alzamil (2019) suggests an integrated quality development model which can be used in the higher education. This model is based on the Deming cycle and the Boehm spiral model. Regarding to Sunder (2016), failing to involve the students can pose a risk in development processes. Differentiation and the credibility of the degree are the most important benefits of continuous improvement (Mourad, 2013).

This ESG guideline is contained in the "Improvement" principle of ISO 9001 in relation to the higher education environment. In case of the ISO 9001 the continuous improvement phenomenon means not only reviewing the programs, but continuously developing the quality management system, monitoring strategic planning and the realization of mission and vision statements (Barraquio, 2018).

4.10. Cyclical external quality assurance

Regarding to the ESG guidelines, higher education institutions have to be externally audited cyclically. This is done by the national accreditation committees by predefined schedule in each country (Mertova & Webster, 2009, Mourad, 2013, Manatos & Sarrico, 2017). This can happen in different levels of the organization, such as on program, faculty or institution level. This is a general way to maintain and increase quality.

A study concluded that there can be both internal and external evaluations of programs, through several ways, such as surveys, focus groups, rankings, evaluations and accreditations (Tasopoulou & Tsiotras, 2017). A well-structured evaluation should be structured, systematic, ongoing and sustainable (Makhoul, 2019). Accreditation should be based on facts and quality, meeting the needs of the stakeholders, but it should be free from politics (Narang, 2012). An agile approach can be to conduct an internal evaluation every semester based on the data of the accreditation office (Al-Fuqaha, 2014). Internal evaluation should include the resources, competences and processes of the organization (Deac et al., 2012). A critics of accreditation is that using only this tool is a not a quality system on its own. Just keeping standards and regulations are not enough for quality (Lamanauskas, 2009).

External quality control (also known as external audit) is also the base of certification according to the ISO 9001 standard. External audits provide information for evidence-based decision making, so the "Cyclical external quality assurance" ESG guideline can be paired with the "Evidence-based decision making" ISO 9001 principle.

5. Conclusions

This research paired the ESG guidelines with the ISO 9001 quality management standard principles. Seven of the ESG guidelines can be matched with ISO 9001 principles as shown in Table 1.

ESG 2015 internal quality guidelines	Related ISO 9001:2015 principles
1. Policy for quality assurance	2. Leadership
2. Design and approval of programs	4. Process approach
3. Student-centered learning, teaching and assessment	1. Customer focus (presumption: students are the customers) 7. Relationship management (not all suppliers are included)
4. Student admission, progression, recognition and certification	-
5. Teaching staff	3. Engagement of people (excluding the administrative staff)
6. Learning resources and student support	-
7. Information management	6. Evidence-based decision making
8. Public information	-
9. On-going monitoring and periodic review of programs	5. Improvement
10. Cyclical external quality assurance	6. Evidence-based decision making

Table 1. Compliance of the ESG guidelines and the ISO 9001 principles
Source: own research

Seven out of the ten guidelines of ESG could be matched with ISO principle. Three of them are different to the ISO 9001 standard because of its general nature. These three guidelines are the following: student admission, progression, recognition and certification; learning resources and student support; public information. The first two is about students and their progress in the education. These cannot be included in the ISO 9001 standard because of their industry-specific nature which can be used only in the education. The third guideline which is not present in the ISO 9001 is about the publicity of the information. As companies are typically operate privately, this cannot be the common goal in their case.

All of the seven ISO 9001 principles appear in the ESG guidelines. However, there are some limitations. Regarding the "Customer focus" and the "Relationship management" principles we have to assume that students are the main customers of higher education, and also consider them as suppliers (Jain et al., 2011, Sunder, 2016, Foster, 2017). Regarding the "Engagement of people" the ESG considers only the academic staff and does not give recommendations about the administrative staff, which is a drawback of ESG.

Overall, there is high match between the ISO 9001 and ESG. Both of them are useable in the education, but the ESG fits it much better because its specialized nature. There are guidelines that are especially useable in the higher education sector only. The ESG better suits the higher education institutions than the ISO 9001, so its use in the higher education sector is recommended.

The results of this study can be utilized by higher education institutions implementing ESG instead or in parallel with the ISO

9001 quality management system.

The study has a focus on ESG which causes limitation in the results. The results can be particularly useful in Europe. Outside Europe other quality management systems may be used in the higher education, such as the Baldrige-criteria in the USA (Houston, 2008). The topic of this study is to show the methods used in Europe, so other quality management systems are not analyzed in this paper.

References

[1] Al-Fuqaha, I.N. (2014). Towards Total Quality Management in Universities: Quality Function Deployment Paradigm and Beyond, *i-manager's Journal of Education Technology*, 11(2), pp. 41-51.

[2] Alzamil, Z.A. (2019). Integrated Quality Model for Flexible Quality Management System, *Quality-Access to Success*, 20(173), pp. 3-8.

[3] Andreeva, T., Popova, L., Yashina, M., Babynina, L., Yaksanova, N. & Natsypaeva, E. (2019). Integration of the Quality Management and Strategic Management Systems into Unified Management System of Enterprises, *Quality-Access to Success*, 20(171), pp. 3-8.

[4] Angell, R.J., Heffernan, T.W. & Megicks, P. (2008). Service quality in postgraduate education, *Quality Assurance in Education*, 16(3), pp. 236-254.

[5] Balashova, E.S. & Gromova, E.A. (2017). TQM as One of the Drivers of Russian Industrial Sector, *Quality-Access to Success*, 18(159), pp. 50-53.

[6] Barraquio, D.T. (2018). Developing A University Quality Assurance Framework, *Information*, 21(4), pp. 1273-1282.

[7] Bedzsula, B. (2015). Minőségmenedzsment módszerek alkalmazási lehetőségei a felsőoktatásban, Taylor: *Gazdálkodás- és Szervezéstudományi Folyóirat*, 7(1-2), pp. 270-277.

[8] Benke, M., Lányi, B., Schmuck, R. & Takács, A. (2019). *Quality Orientation in the Higher Education, New Researches from Business Studies*, Komarno: International Research Institute, pp. 124-132.

[9] Benner, M.J., Veloso, F.M. (2008). ISO 9000 practices and financial performance: a technology coherence perspective, *Journal of Operations Management*, 26(6), pp. 611-629.

[10] Castello, J., Castro, R. de & Marimon, F. (2020). Use of Quality Tools and Techniques and Their Integration into ISO 9001: A Wind Power Supply Chain Case, *International Journal of Quality & Reliability Management*, 37(1), 68-89. https://www.doi.org/10.1108/IJQRM-07-2018-0171

[11] Castka, P. (2018). Modelling Firms' Interventions in ISO 9001 Certification: A Configurational Approach, *International Journal of Production Economics*, 201, pp. 163-172. https://www.doi.org/10.1016/j.ijpe.2018.05.005

[12] Castka, P. & Balzarova, M.A. (2018). An Exploration of Interventions in ISO 9001 and ISO 14001 Certification Context – A Multiple Case Study Approach, *Journal of Cleaner Production*, 174, pp. 1642-1652. https://10.1016/j.jclepro.2017.11.096

[13] Certop (2015). *Tájékoztató az ISO 9001 és ISO 14001 szabványváltozásokról*. Budapest: CERTOP Termék- és Rendszertanúsító Kft.

[14] Crombag, H. (1978). On Defining Quality of Education, *Higher Education*, 7(4), pp. 389-403.

[15] Deac, V., Cârstea, G. & Drăgan, D. (2012). Strategy and Competitive Advantage: VI. Strategic Internal Diagnostic, *Quality-Access to Success*, 13(126), pp. 86-89.

[16] Dellana, S. & Kros, J. (2018). ISO 9001 and Supply Chain Quality in the USA, *International Journal of Productivity and Performance Management*, 67(2), pp. 297-317. https://www.doi.org/10.1108/IJPPM-05-2015-0080

[17] Din, S., Abd-Hamid, Z. & Bryde, D.J. (2011). ISO 9000 Certification and Construction Project Performance: The Malaysian Experience, *International Journal of Project Management*, 29, pp. 1044-1056. https://www.doi.org/10.1016/j.ijproman.2010.11.001

[18] Dovleac, R., Sad, A., Ionică, A. & Leba, M. (2019). Quality Management and Web 2.0 Tools Embedded in the Agile Approach for Education, *Quality-Access to Success*, 20(S1), pp. 329-334.

[19] ESG (2005). *Standards and Guidelines for Quality Assurance in the European Higher Education Area*, Bergen, Norway.

[20] ESG (2015). *Standards and Guidelines for Quality Assurance in the European Higher Education (ESG)*, Brussels, Belgium.

[21] Foster, S. (2017). *Managing Quality: Integrating the Supply Chain*. Sixth Edition, Pearson.

[22] Green, T.J. (2007). Quality Costs in Education, *The TQM Magazine*, 19(4), pp. 308-314. https://www.doi.org/10.1108/09544780710756214

[23] Hebbar, R.R. & Mathew, A.O. (2017). Impact of Quality Culture on Total Quality Management Practices and Quality Performance – A Case Study, *Quality-Access to Success*, 18(157), pp. 95-100.

[24] Hewitt, F. & Clayton, M. (1999). Quality and Complexity – Lessons from English Higher Education, *International Journal of Quality & Reliability Management*, 16(9), pp. 838-858.

[25] Hill, Y., Lomas, L. & MacGregor, J. (2003). Students' Perceptions of Quality in Higher Education, *Quality Assurance in Education*, 11(1), pp. 15-20.

[26] Houston, D. (2008). Rethinking Quality and Improvement in Higher Education, *Quality Assurance in Education*, 16(1), pp. 61-79.

[27] Illés, B., Tamás, P., Dobos, P. & Skapinyecz, R. (2017). New Challenges for Quality Assurance of Manufacturing Processes in industry 4.0, *Solid State Phenomena*, 261, pp. 481-486. https://www.doi.org/ 10.4028/www.scientific.net/SSP.261.481

[28] ISO (2015). *Quality Management Principles*, Geneva: ISO.

[29] Jain, R., Sinha, G. & Sangeeta, S. (2011). Conceptualizing Service Quality in Higher Education, *Asian Journal on Quality*, 12(3), pp. 296-314. https://www.doi.org/10.1108/15982681111187128

[30] Kozma, T. (2013). *A minőségbiztosítás szerepe és fejlesztése a felsőoktatási intézményekben és annak hallgatói értelmezése a gyakorlatban*, PhD dissertation, Gödöllő: Szent István University.

[31] Lamanauskas, V. (2009). From Quality Management to Management Quality: Systematic Approach, *Problems of Education in the 21st Century*, 12, pp. 5-8.

[32] Lapina, I., Roga, R. & Müürsepp, P. (2016). Quality of Higher Education: International Students' Satisfaction and Learning Experience, *International Journal of Quality and Service Sciences*, 8(3), pp. 263-278. https://www.doi.org/10.1108/IJQSS-04-2016-0029

[33] Lisbon Recognition Convention (1997). *Convention on the Recognition of Qualifications Concerning Higher Education in the European Region*, Lisbon: Council of Europe and UNESCO, Lisbon.

[34] Makhoul, S.A. (2019). Higher Education Accreditation, Quality Assurance and Their Impact to Teaching and Learning Enhancement, *Journal of Economic and Administrative Science*s, 35(4), pp. 235-250. https://www.doi.org/10.1108/JEAS-08-2018-0092

[35] Man, M.M.K & Kato, I. (2010). Japanese Management and Total Quality Management (TQM) - The Application in Higher Education Institutions, *International Journal of Management and Innovation*, 2(2), pp. 1-8.

[36] Manatos, M.J., Sarrico, C.S. & Rosa, M.J. (2017). The European Standards and Guidelines for Internal Quality Assurance: An Integrative Approach to Quality Management in Higher Education?, *The TQM Journal*, 29(3), pp. 342-356. https://www.doi.org/10.1108/TQM-01-2016-0009

[37] Mause, K. (2010). Considering Market-Based Instruments for Consumer Protection in Higher Education, *Journal of Consumer Policy*, 33, pp. 29-53.

[38] Mertova, P & Webster, L. (2009). The Academic Voice in English and Czech Higher Education Quality, *Quality Assurance in Education*, 17(2), pp. 140-155. https://www.doi.org/10.1108/09684880910951363

[39] Moldovan, L. (2012). Integration of Strategic Management and Quality Assurance in the Romanian Higher Education, *Procedia – Social and Behavioral Sciences*, 58, pp. 1458-1465. https://www.doi.org/10.1016/j.sbspro.2012.09.1132

[40] Mourad, M. (2013). Students' Perception of Quality Assurance Activities: Case study from the European Higher Education Market, Sustainability Accounting, *Management and Policy Journal*, 4(3), pp. 345-365. https://www.doi.org/10.1108/SAMPJ-01-2013-0007

[41] Narang, R. (2012). How Do Management Students Perceive the Quality of Education in Public Institutions?, *Quality Assurance in* Education, 20(4), pp. 357-351. https://www.doi.org/10.1108/09684881211263993

[42] Nelyubina, E.G., Safina, L.G., Panfilova, L.V., Kazantsev, I.V., Molchatsky, S.L., Stepanova, E.S. & Ibrahimova, S.A. (2016). In-University Quality Management System of Education Based on the Competence Approach, *International Review of Management and Marketing*, 6(1), pp. 165-171.
[43] OFI (2011). *Nemzetközi és hazai bevált gyakorlatok a minőségfejlesztésben,* FEMIP könyvek sorozat, Budapest: Oktatáskutató és Fejlesztő Intézet.
[44] OFI (2012). *Felsőoktatási minőségfejlesztési kézikönyv*, Budapest: Oktatáskutató és Fejlesztő Intézet.
[45] Petőcz, M. & Szabó, J. (2003). *Minőségirányítás – Minőségmenedzsment*, Budapest: PMS 2000 Mérnöki Társaság.
[46] Rezenau, O.M. (2011). The Implementation of Quality Management in Higher Education, *Procedia – Social and Behavioral Sciences*, 15, pp. 1046-1050. https://www.doi.org/ 10.1016/j.sbspro.2011.03.237
[47] Randhawa, J.S. & Ahuja, I.S. (2018). Empirical Investigation of Contributions of 5S Practice for Realizing Improved Competitive Dimensions, *International Journal of Quality & Reliability Management*, 35(3), pp. 779-810. https://www.doi.org/ 10.1108/IJQRM-09-2016-0163
[48] Redmond, R., Curtis, E., Noone, T. & Keenan, P. (2008). Quality in Higher Education: The Contribution of Edward Deming's Principles, *International Journal of Educational Management*, 22(5), pp. 432-441. https://www.doi.org/10.1108/09513540810883168
[49] Rodríguez-Mantilla, J.M., Martínez-Zarzuelo, A. & Fernández-Cruz, F.J. (2020). Do ISO:9001 Standards and EFQM Model Differ in Their Impact on the External Relations and Communication System at Schools?, *Evaluation and Program Planning*, 80, 101816. https://www.doi.org/10.1016/j.evalprogplan.2020.101816
[50] Schmuck, R. (2010). *A minőségirányítás alapjai*, Pécs: Comenius.
[51] Shu, Y., Woo, C., Koh, J. & Jeon, J. (2019). Analysing the Satisfaction of University-Industry Cooperation Efforts Based on the Kano Model: A Korean Case, *Technological Forecasting and Social Change*, 148, 119470. https://www.doi.org/10.1016/j.techfore.2019.119740
[52] Siva, V., Gremyr, I., Bergquist, B., Garvare, R., Zobel, T. & Isaksson, R. (2016). The Support of Quality Management to Sustainable Development: a Literature Review, *Journal of Cleaner Production*, 138, pp. 148-157. https://www.doi.org/ 10.1016/j.jclepro.2016.01.020
[53] Srikanthan, G. & Dalrymple, J.F. (2007). A Conceptual Overview of a Holistic Model for Quality in Higher Education, *International Journal of Educational Management*, 21(3), pp. 173-193. https://www.doi.org/10.1108/09513540710738647
[54] Sultan, P. & Wong, H.Y. (2010). Service Quality in Higher Education - A Review and Research Agenda, *International Journal of Quality and Service Sciences*, 2(2), 259-272. https://www.doi.org/10.1108/17566691011057393
[55] Sunder, V.M. (2016). Lean Six Sigma in Higher Education Institutions, *International Journal of Quality & Service Sciences*, 8(2), pp. 159-178. https://www.doi.org/10.1108/IJQSS-04-2015-0043
[56] Sutherland, D., Warwick, P. & Anderson, J. (2019). What Factors Influence Student Satisfaction with Module Quality? A Comparative Analysis in a UK Business School Context, *International Journal of Management Education*, 17(3). DOI:10.1016/J.IJME.2019.100312.
[57] Tănase, G.I. & Velica, M. (2015). Education Quality Management through the Implementation of Quality Principles "ISO", *Valahian Journal of Economic Studies*, 6(1), pp. 53-58.
[58] Tasopoulou, K. & Tsiotras, G. (2017). Benchmarking Towards Excellence in Higher Education, *Benchmarking: An International Journal*, 24(3), pp. 617-634. https://www.doi.og/10.1108/BIJ-03-2016-0036
[59] Todorut, A.V. & Bojincă, M. (2013). Total Quality Management and Quality Culture, *Quality-Access to Success*, 14(132), pp. 79-82.
[60] Trivellas, P. & Dargenidou, D. (2009). Leadership and Service Quality in Higher Education: The case of the Technological Educational Institute of Larissa, *International Journal of Quality and Service Sciences*, 1(3), pp. 294-310. https://www.doi.org/10.1108/17566690911004221
[61] Vauterin, J.J., Linnanen, L. & Marttila, E. (2011). Issues of Delivering Quality Customer Service in a Higher Education Environment, *International Journal of Quality and Service Sciences*, 3(2), pp. 181-198. https://www.doi.org/10.1108/17566691111146087
[62] Veress, G. (1999). *A felsőoktatási intézmények minőségmenedzsmentje*, Budapest: Műszaki Könyvkiadó.

Association between Patient Outcomes and *Joint Commission International (JCI)* Accreditation in Italy: An Observational Study

Maura CAMPRA[1], Patrizia RIVA[2], Gianluca ORICCHIO[3], Valerio BRESCIA[4*]

[1]Full Professor, Department of Economics and Business Studies,
University of Piemonte Orientale "Amedeo Avogadro", Via Perrone, 18, Novara (NO), Italy
[2]Associate Professor, Department of Economics and Business Studies,
University of Piemonte Orientale "Amedeo Avogadro", Via Perrone 18, Novara (NO), Italy
[3]Chairman of Health in Italy, Association of International Patients, Italy – via Vincenzo Monti 25, 20123 Milan, Italy
[4]Research fellow, Department of Management, C.so Unione Sovietica 218 bis, University of Turin, 10134 Turin, Italy
[*]Corresponding author; E-mail: valerio.brescia@unito.it

Abstract

Quality in healthcare is a constantly debated topic and has not found a clear definition to date. If we consider the possible quality standards related to health services, the Joint Commission identifies the main criteria that health organizations must respect in order to guarantee patient safety. The Joint Commission International – founded in 1994 by the JC – also accredits organizations in countries other than the USA and Canada to ensure better minimum quality levels. The study investigates the possibility of obtaining a better outcomes of the health structures accredited in Italy by the Joint Commission International compared to the other the other health organizations of the Italian system considering the mortality index as an indicator recognized by the literature as a summary indicator of outcome. The National Outcome Program (PNE) created by the Italian Ministry of Health allows comparative effectiveness researches based on relative risk. This study performs the analysis based on the results of the past three years available and on the volume of activities provided. Given a p-value significance index <0.05, the analysis highlights the absence of a significant difference between accredited and non-accredited structures. The study contributes to the literature on health system outcomes and performance and has relevance considering researches in health tourism and health mobility policies fields.

Keywords: *PNE; Joint Commission; medical tourism; index of mortality; healthcare quality standard.*

1. Introduction

Quality in healthcare has been a topic debated in literature for some time but it has not yet found a clear definition (Reeves and Bednar, 1994; Mitchell, 2008; Mosadeghrad, 2014; Tradori, Brescia and Biancone, 2019; Biancone *et al*., 2020). Normally quality in healthcare is defined as quality systems or quality standards, or even considering mixed models (Donabedian, 1981; Chae *et al*., 2003; Douglas and Fredendall, 2004; Lillrank and Liukko, 2004; Kwan *et al*., 2019). At present the reality is complex and very often bases these parameters on voluntary organizational efforts (Bode, 2006; Baker *et al*., 2007; Legido-Quigley and Nolte, 2008). The analysis conducted focuses on quality standards definable as process outcomes (Alkhenizan and Shaw, 2011).

Among the most debated, we find the standards defined by the Joint Commission of American origin that evaluates the health performance of the organization based on minimum standards aimed at guaranteeing patient safety (McIntyre, Rogers and Heier, 2001; Morath and Turnbull, 2005). The American surgeon Ernest A. Codman (Roberts, Coale and Redman, 1987) founded an hospital, called "*End Results Hospital*" (Neuhauser, 2002) in 1911, and launched the "*American College of Surgeons Program*" in 1913 (1917) to evaluate the application of the care provided. Given that out of 692 hospitals (with at least 100 beds each one), only 89 were able to meet the efficiency standards set by the American College. In 1919, a list of five performance requirements for hospitals was decided to ensure towards an acceptable minimum (Roberts, Coale and Redman, 1987). The percentage of hospitals whose activity was shown to comply with the required standards went from 13% in 1919 to 50% in 1950.

In 1951, to meet both the high costs of various projects and the growing complexity of clinical reality, the *American College of Surgeons* decided to associate with the *American College of Physician, the American Medical Association* and the *Canadian Medical Association* in order to found the *Joint Commission on Accreditation of Hospitals* (Jost, 1994). This non-profit organization defined the criterion for evaluating the quality of the "*Optimal Standard*" as a maximum level reachable on the basis of the resources available (rather than an excellent in an ideal sense) leading to the realization of the *Accreditation Manual for Hospitals* (1970) as a primary tool for a systematic hospital accreditation activity (Affeldt, 1980). Such a voluntary accreditation modelled today to the accreditation of approximately 80% of American hospitals by a delegation from the US government (McGreevey, Nadzam and Corbin, 1997; Lam *et al*., 2018). The Joint Commission born in America in 1951 has two nonprofit affiliate organizations: The Joint Commission Center for Transforming Healthcare aims to solve health care's most critical safety and quality problems and Joint Commission Resources (JCR) offers educational services, publications, and software to complement

your accreditation experience. Joint Commission International, a division of JCR, accredits and certifies international health care organizations.

Currently, the *International Joint Commission* – founded by the Joint Commission – also accredits hospitals in other countries in order to guarantee the quality of services according to standard criteria (Smith and Forgione, 2007; Longo *et al*., 2017). The American health system has prompted many residents to direct their choice of care to countries where care is cheaper and more accessible (Yousefian *et al*., 2013). To this end, various health facilities have been accredited, especially in Asia, with the birth of the phenomenon called *medical tourism* (York, 2008; Pafford, 2009; Heung, Kucukusta and Song, 2011). The phenomenon of voluntary accreditation of healthcare facilities, conducted by the *International Joint Commission*, affects not only Asia but also other countries, including Italy (Lemarquand, 1993; Arcari, 2003). The evaluation of the performance of the structures accredited according to the standards of the *International Joint Commission* can increase the definition of better structures in terms of health care and hospitality.

However, numerous American studies show that accredited hospitals do not achieve better quality levels in terms of mortality and patient experience (Lam *et al*., 2018). Therefore, the question arises as to whether accreditation is related to higher quality of performance and patient safety that can be assessed through the mortality index.

For several years, Italy has launched a *National Outcome Program (PNE)* evaluation program coordinated by the Ministry of Health which, through a process of comparative effectiveness research, allows performance evaluation taking into account various factors. Therefore, through the analysis of the relative risk, this study investigates whether the accredited Italian hospitals are better than the national average, the analysis also takes into account the statistical significance that the program makes available. The healthcare facilities considered are all part of the Italian public national healthcare system as there are no private structures in the PNE surveys.

To date, no studies are investigating the phenomenon of correlations between IJC accreditation and hospitals effectiveness results in Italy. Instead it could be useful, if we consider the new directives which intend to increase the phenomenon of medical tourism in Italy while keeping the phenomenon under control.

2. Literature review

2.1. Joint Commission, Joint Commission International and quality standards

The Joint Commission (www.jcrinc.com) (3-5) is an American non-profit, non-governmental entity founded in 1951 that has accredited over 20,000 healthcare organizations in the United States to date (Roberts, Coale and Redman, 1987). The mission is to improve health care for citizens, in collaboration with other stakeholders, evaluating health organizations, and inspiring them to excel in providing safe and effective treatments of the highest quality and value (Nadzam, 1991). Today the Joint Commission, made up of approximately 500 employees and 700 supervisors, is led by a 28-member Commission, an expression of the associations of nurses, consumers, doctors, clinical directors, administrators, producers, trade union organizations, quality experts, insurers, trainers, etc. The multidisciplinary composition brings to the Joint Commission the most varied experiences in the field of assistance and health policy. The structures that are evaluated and accredited include general, psychiatric, paediatric, rehabilitation hospitals; welfare networks; home service organizations and support services, home infusion therapy and other drug treatment services; hospice; programs for subacute diseases, dementia and long-term care; mental health and detoxification services, services for the disabled, outpatient services; clinical laboratories.

In 1994, the US *Joint Commission* founded the *Joint Commission International (JCI)* in response to numerous requests from hospitals in other countries around the world (Donahuae e Vanostenberg 2000). To date, JCI has accredited hospitals and other healthcare institutions in more than 90 countries around the world. JCI currently has three affiliated agencies in Europe, Asia, and South America. To obtain and maintain *The Joint Commission's Gold Seal of Approval* it is necessary to support and pass a site visit on all standards, and accreditation is valid for three years. Besides, JCI works with health care organizations, governments, and sponsors internationally to promote rigorous standards of care and provide solutions to achieve optimal results. JCI experts assist organizations in three ways: accreditation, training, and consultancy services (Robinson, 1995). The development of better standards for patient care and the evolution of results-oriented processes towards the patient has earned her the international recognition of leaders in healthcare.

This is why the *World Health Organization (WHO)* joined JCI to found the first WHO Collaboration Centre for patient safety solutions (Baretich, 2020). A working group developed the international standards made up of 16 members from all over the world, including doctors, nurses, administrators, and policy experts, subsequently reviewed in over ten countries and then discussed in six focus groups. The standards relating to "Patient and family rights" and to "Infrastructure Management and Security" required two specific panels of experts. After the second phase in which the verification process was tested in five countries, the JCI standards were finally approved by the JCI team and JCI board.

Hospital standards are assessed on three levels every three years: the *Joint Commission Committee for international accreditation* proposes variations based on visits and international literature; the proposals are sent to the referents of the participating hospitals to express their opinion on the criteria of relevance, feasibility, and relevance. *The Joint Commission Resources Board of Directors* (team of healthcare experts who oversee define and interpret standards) provides the final opinion on maintaining or modifying current and proposed *standards*. The manual is republished every three years after consulting the accredited organizations. In the various editions, while keeping the structure firm, the standards have been refined, and the level of requirements has been raised, leading the organizations that accredit or renew accreditation to essential efforts in terms of quality and safety. In this regard it is recalled that since 2009 the International Patient Safety Goals have been introduced which deal with topics such as safety for the prevention of accidental falls, safety in hand washing, safety in the surgical act, safety in the use of high-risk drugs, safety in the identification of the patient and safety in communication between operators, all considered essential standards for obtaining accreditation and fundamental for not endangering the patient's life or safety (Wachter, 2010). The manual contains hundreds of standards that collectively include thousands of measurable elements. The standards are organized into chapters that embrace the hospital organization globally on all processes. The phases that characterize the accreditation process include four phases. The process lasts for a maximum of 26 months. Phase 1 self-evaluation of the possession or not of the requisites required (pre-survey evaluation) (1st month). Phase 2 creation of improvement groups and production of improvement projects to meet the requirements (duration from 12th month to 18th). Phase 3 accreditation visit (survey) (duration from 18th month to 24th). Phase 4 accreditation (duration from 20th month to 26th). During the visit, JCI representatives carry out training and consultancy activities and provide recommendations to facilitate the achievement of standards. If the requirements are achieved, the organization passes the fourth phase and reaches accreditation valid for three years. The possible levels are identified in: accreditation status or accreditation rejected.

2.2. Italian PNE and comparative effectiveness research

The progress of study design and statistical analysis methodologies and the ever-increasing availability and validity of information systems and databases in advanced health systems have highlighted the role of "comparative effectiveness research" (Garber, 1992; Hernán, 2011; Gargon, Gorst and Williamson, 2019). It is intended as a comparative observational assessment of health services and interventions. The comparative assessments of hospitals, by structure, by diagnosis, by procedures, by organizational characteristics, are cases of application of the methods of comparative effectiveness research (de Lemos and Nallamothu, 2020). At the international level, the experiences of comparative assessment among structures have been consolidated for several years.

The Italian National Outcome Program (PNE – Piano Nazionale Esiti) is developed by Italian National Agency for Regional Health Services (AGENAS) on behalf of the Ministry of Health and provides a national level of comparative evaluation of the efficacy, safety, efficiency, and quality of the care produced within the health service. The areas of assessment are, as regards the production function, the individual hospitals, and, as regards the protection or commissioning function, the local health companies. The critical and administrative issues that must have greater relevance are discussed within the PNE Committee, made up of representatives of Regions, Autonomous Province, Ministry of Health and scientific institutions. Design, management, the definition of control, data analysis, and management of the website are carried out by the Epidemiology Department of the regional health service of the Lazio Region, as the PNE operations centre of AGENAS.

Italian PNE measures are evaluation tools to support clinical and organizational auditing programs aimed at improving effectiveness and equity in the National Heath System. PNE does not produce rankings, evaluations, or report cards. The process leading to the definition of an outcome indicator begins with a systematic review of the medical-scientific literature relating to the treatment or therapeutic, diagnostic course that is intended to be assessed. The information derived from this first revision phase allows to define a first version of the protocol to be used to conduct preliminary analyzes that will allow to verify the validity of the indicator. The indicators are documented by protocols with an explicit definition of the outcome in the study, of the selection criteria of the cases, of the follow-up times, of the sources of the data and of the factors used for the risk adjustment. The results of the preliminary analyzes are subjected to the evaluation of representatives of the reference scientific societies, panels of experts, and further clinicians discussed within the PNE Committee.

Literature outlines that outcome indicators measure the outcome of a care process in terms of clinical outcomes (e.g., mortality, disease, hospitalizations) (Tu *et al*., 2003). Their relationship with the measured phenomenon is influenced by several determinants that are not directly correlated with the quality of the care process (risk markers, environmental factors, socio-economic variables), and that must be considered and possibly corrected while figuring indicators. The robustness of the outcome indicators also depends on the time elapsed between the measurement and the actual delivery of the health service. Process indicators measure the degree of adherence of the care process to the reference standards of best evidence-based clinical practice. For this reason, they are considered proxies of the outcomes of the assistance and their robustness, understood as predictive of the clinical outcomes, depends on the strength of the clinical recommendation and the degree of evidence on which they were built. In addition, indicators of activity volumes are calculated for health interventions for which scientific evidence is available of the association between volumes of activity and outcomes of care (Halm, Lee and Chassin, 2002). Finally, the quality of territorial assistance is assessed by measuring the so-called "ambulatory care sensitive conditions" (ACSC), which can be defined as situations in which quality territorial assistance allows avoiding the use of avoidable hospitalizations or early intervention allows preventing complications or more pathologies serious (Ansari, Laditka and Laditka, 2006).

2.3. Index of mortality

In literature, the most used outcome of healthcare service in studies is the rate of intra-hospital mortality within 30 days of discharge (Thomas, Longford and Rolph, 1994; Leyland and Boddy, 1995; Goldstein and Spiegelhalter, 1996; Marshall and Spiegelhalter, 1999, 2001). The *mortality rate* is the ratio between the number of deaths in a community of people over a period of time and the amount of the average population over the same period (Gryfe, Amies and Ashley, 1977). The *mortality rate* measures the frequency of deaths of a population over a period of time and is normally referred to a calendar year. This data is used to verify the negative state of development of a population. The *mortality rate* for a given year is equal to a houndred times the ratio between the number of deaths in that year and the average population. Although some authors have stated that the indicator alone is not enough to define the outcome of treatments (Epstein, 1998; Marshall and Spiegelhalter, 2001), it is also true that it is the easiest to calculate and monitor. Clinical or clinical outcome indicators can be used to solve the problem epidemiological, specific for each pathology, built according to criteria derived from the scientific literature, collected *ad hoc*, or from medical records or documentation directly related to the treatment. This is already happening in some countries due to the mortality rate, which is systematically collected by the hospital and geographical areas, in some cases taking into account the individual characteristics of the patients undergoing edited thanks to the use of the same or similar methodologies. In Italy the National Outcome Program (PNE) already considers this information gathering approach. According to Birkmeyer (Birkmeyer *et al*., 2002; Ghaferi, Birkmeyer and Dimick, 2011) the analyzes of those kind of dataset overall show an inverse relationship between the volume of activity and mortality, confirming that this association has to do with quality. The study focused – in the Italian context – on the possible relationship between the volume of activity and quality would derive from the fact that the volume can be considered a good proxy of the experience of the providers of the choice of the providers of the citizens. The PNE considers only the statistically significant thresholds for assessing the mortality rate for each health service observed. If the number of cases is not sufficient for the expected mortality rate, the PNE does not present the result.

3. Method

The measure used to determine whether the structure is statistically better than the national average or the benchmarking average is the *Relative Risk (RR)* (Dyer and Sarin, 1982). The RR is calculated as the ratio between two rates / proportions and expresses the excess (or defect) of risk of the group placed in the numerator compared to the group placed in the denominator (Barlow and Prentice, 1988). For example, if for the healthcare organization of residence A the mortality RR compared to Health organization B (reference area) is equal to 2, it can be concluded that the residents in Health Organization A have a risk of death twice higher than that of residents of Health Organization B. Vice versa, if for the Health Organization of residence C the mortality RR is 0.25, the residents of this Health Organization have a risk of death four times smaller than that observed in the reference Health Organization.

For some indicators the measure the association used is the *Hazard Ratio (HR)*, interpretable as an instant RR. The relative risk measure adopted in this case takes into account the mortality rate identified as a useful indicator to define the practical

effectiveness of the treatments, the parameter takes into account comorbidity and specific epidemiological criteria for each pathology (Miettinen, 1970). The data is also related to the volume of activity provided (Landis, 2004). The p-value that the PNE identifies for each mortality rate allows to determine the significance of the same with respect to the national sample (Parvizi, Ereth and Lewallen, 2004; Reid *et al*., 2009; Devereaux *et al*., 2012). The value of p represents the probability that the observed Relative Risk differs from one (null hypothesis) only as a result of the case. A p-value close to unity indicates, for example, that a mortality RR is no different from 1; in other words, the mortality rates in the two groups compared are not, from a statistical point of view, significantly different. On the other hand, a low p-value indicates that the difference observed between the two groups cannot be attributed solely to the effect of chance. P-values less than or equal to 0.05 indicate that the mortality rates in the two groups are, from a statistical point of view, significantly different (Afifi and Elashoff, 1967; Marill, 2004; Bailar and Hoaglin, 2012).

3.1. The sample

The analyzed sample was obtained manually from the Joint Commission website. The structures were accredited before 2016.

The sample consisted primarily of *23 healthcare facilities* located on the Italian territory. However, *9 structures were not considered* as they are not present in the PNE, as they are rehabilitative or diagnostic and do not involve a collection of mortality rates *(CDI Centro Diagnostico Italiano S.p.a. – Milan, Ceinge Biotecnologie Avanzate scarl – Napoli, Fondazione Centri di Riabilitazione Padre Pio ONLUS San Giovanni Rotondo – Milano, Istituto Mediterraneo per i Trapianti e le Terapie ad Alta Specializzazione – Palermo, S.D.N. S.p.A. – Napoli, Santa Chiara Hospital – Trento, UPMC San Pietro FBF – Advanced Radiotherapy Center – Roma, A.p.s.p. Residenza – Valle dei Laghi Cavedine, Casa di Cura Villa San Benedetto – Menni Albese con Cassano. A structure is located on the Vatican territory; therefore, it is not considered in the Italian databases (Ospedale Pediatrico Bambino Gesù – Roma)*. There were also *5 structures* that, by volume of cases treated, did not gather representative mortality data and therefore, were not considered *(Centro Chirurgico Toscano Srl – Arezzo; IRCCS Centro San Giovanni di Dio Fatebenefratelli – Brescia, Istituto di Medicina Fisica e Riabilitazione "Gervasutta" – Udine, Giannina Gaslini Children's Hospital – Genova; Presidio Ospedaliero Ospedale dei Bambini – Brescia)*.

Therefore, the study was able to consider the results of the specialist activities of 8 facilities. These are located as follows: 5 structures in northern Italy, 2 in the south Italy and 1 in the central Italy. The activities which have resulted mappable by structure fall in a range from one to eighteen. These specializations have resulted in having gathered measures of mortality rate detectable thirty days after the different intervention.

4. Result

Accredited Joint Commission Structures present on average a relative risk better than other national health structures, also considering the volume of services performed (see table 1).

In some years the structures do not reach the minimum thresholds of performance volumes in order to be able to consider the data reliable. Nevertheless, the p-value almost always shows a lack of significance of the result, however not confirmed in the three years considered. This result excludes the possibility of affirming a continuity of the significance of the rate concerning the national average in consecutive terms.

Structure and activity mortality rate	RR (ADJ) 2016	P-value 2016	Indeed significant 2016	RR (ADJ) 2017	P- value 2017	Indeed significant 2017	RR (ADJ) 2018	P-value 2018	Indeed significant 2018
1) COT Cure Ortopediche Traumatologiche S.p.A. Messina (Southern Italy)									
Chronic renal failure: mortality 30 days after hospitalization	0.16	0.068	0	0.26	0.057	0	0.52	0.146	0
European Institute of Oncology (Istituto Europeo di Oncologia) Milano (Northern Italy)									
TM kidney surgery: 30-day mortality	0.37	0.322	0	0.41	0.377	0	0.41	0.376	0
TM stomach surgery: 30-day mortality	0.34	0.134	0	0.30	0.188	0	0.37	0.156	0
TM colon surgery: 30-day mortality	0.59	0.369	0	-	-	-	-	-	-
Rectal TM surgery: 30-day mortality	0.80	0.821	0	-	-	-	-	-	-
Surgery for TM lung: 30-day mortality	0.65	0.262	0	-	-	-	0.73	0.418	0
Surgery for TM prostate: 30-day readmissions	1.26	0.301	0	-	-	-	0.99	0.962	0
Fondazione Poliambulanza Brescia Northern Italy)									
Acute myocardial infarction: 30-day mortality	0.83	0.415	0	0.57	0.053	0	0.74	0.277	0
TM kidney surgery: 30-day mortality	0.59	0.612	0	-	-	-	-	-	-
Surgery for liver TM: 30-day mortality	0.95	0.946	0	-	-	-	-	-	-
Brain T surgery: mortality 30 days after craniotomy	1.11	0.807	0	0.68	0.504	0	0.43	0.234	0
Chronic renal failure: mortality 30 days after hospitalization	0.76	0.390	0	0.50	0.082	0	0.80	0.263	0
Isolated Aortocoronary bypass: 30-day mortality	0.34	0.128	0	0.25	0.169	0	0.66	0.558	0
Congestive heart failure: 30-day mortality	1.16	0.318	0	1.20	0.212	0	1.08	0.569	0
Repair of unbroken abdominal aortic aneurysm: 30-day mortality	0.32	0.251	0	0.59	0.466	0	0.66	0.558	0
Non-varicose hemorrhage of the upper intestinal tract: 30-day mortality	0.58	0.226	0	0.79	0.568	0	0.97	0.943	0
Acute myocardial infarction without PTCA: 30-day mortality	0.91	0.724	0	0.60	0.208	0	0.93	0.839	0
Femoral neck fracture: 30-day mortality	0.69	0.326	0	0.91	0.791	0	0.64	0.281	0
Ischemic stroke: 30-day mortality	0.94	0.735	0	0.56	0.021	1	0.47	0.005	1
COPD exacerbated: 30-day mortality	1.20	0.353	0	0.86	0.483	0	1.06	0.751	0
TM stomach surgery: 30-day mortality	0.45	0.173	0	0.35	0.136	0			
TM colon surgery: 30-day mortality	0.66	0.422	0	0.78	0.595	0	0.54	0.223	0
Rectal TM surgery: 30-day mortality	1	0.997	0	-	-				
Acute Myocardial Infarction with execution of PTCA within 2 days: mortality at 30 days	0.92	0.826	0	0.72	0.421	0	0.74	0.277	0
Surgery for TM lung: 30-day mortality	1.79	0.420	0	0.88	0.898	0	1.10	0.923	0

Structure and activity mortality rate	RR (ADJ) 2016	P-value 2016	Indeed significant 2016	RR (ADJ) 2017	P- value 2017	Indeed significant 2017	RR (ADJ) 2018	P-value 2018	Indeed significant 2018
2) Humanitas Gavazzeni Bergamo (Northern Italy)									
Acute myocardial infarction: 30-day mortality	0.63	0.232	0	0.86	0.660	0	0.58	0.192	0
Surgery for liver TM: 30-day mortality	0.60	0.611	0	-	-				
Chronic renal failure: mortality 30 days after hospitalization	0.48	0.048	1	0.88	0.662	0	0.36	0.004	1
Isolated Aortocoronary bypass: 30-day mortality	0.16	0.064	0	-	-		0.45	0.177	0
Valvuloplasty or replacement of heart valves: 30-day mortality	0.68	0.350	0	0.52	0.150	0	0.38	0.053	0
Congestive heart failure: 30-day mortality	0.52	0.108	0	0.19	0.020	1	0.55	0.139	0
Repair of unbroken abdominal aortic aneurysm: 30-day mortality	0.53	0.522	0	1.q2	0.869	0	1.98	0.24	0
Femoral neck fracture: 30-day mortality	1.98	0.018	1	1.09	0.833	0	0.58	0.281	0
TM stomach surgery: 30-day mortality	1	0.994	0	1.20	0.720	0	0.62	0.508	0
TM colon surgery: 30-day mortality	0.52	0.220	0	0.65	0.421	0	0.23	0.146	0
Surgery for TM lung: 30-day mortality	1.61	0.294	0	0.88	0.822	0	-	-	-
3) Humanitas Istituto Clinico Catanese Catania (Southern Italy)									
Surgery for TM lung: 30-day mortality	0.70	0.727	0	-	-	-	-	-	-
4) IRCCS Istituto Clinico Humanitas Milano (Northern Italy)									
Acute myocardial infarction: 30-day mortality	0.35	0.012	1	0.64	0.159	0	0.57	0.136	0
Acute Myocardial Infarction: 30-day mortality (main diagnosis)	0.35	0.020	1	-	-		0.33	0.006	1
TM kidney surgery: 30-day mortality	0.64	0.532	0	0.80	0.548	0	0.32	0.254	0
Surgery for TM pancreas: 30-day mortality	0.21	0.118	0	-	-	-	-	-	-
Surgery for liver TM: 30-day mortality	0.23	0.140	0	0.85	0.741	0	0.60	0.383	0
Brain T surgery: mortality 30 days after craniotomy	0.63	0.195	0	0.42	0.034	1	0.47	0.032	1
Chronic renal failure: mortality 30 days after hospitalization	0.62	0.032	1	0.37	0.000	1	0.32	0.254	0
Valvuloplasty or replacement of heart valves: 30-day mortality	0.71	0.363	0	0.47	0.131	0	0.47	0.068	0
Congestive heart failure: 30-day mortality	0.27	0.001	1	0.26	0.000	1	0.33	0.006	1
Repair of unbroken abdominal aortic aneurysm: 30-day mortality	0.47	0.453	0	0.18	0.089	0	-	-	-
Non-varicose hemorrhage of the upper intestinal tract: 30-day mortality	0.84	0.725	0	0.59	0.365	0	0.42	0.225	0
Femoral neck fracture: 30-day mortality	0.14	0.050	0	0.18	0.089	0	0.69	0.523	0
Ischemic stroke: 30-day mortality	0.81	0.413	0	0.44	0.016	1	0.52	0.027	1
COPD exacerbated: 30-day mortality	0.40	0.042	1				0.37	0.046	1
TM stomach surgery: 30-day mortality	0.58	0.287	0	0.14	0.051	0	0.49	0.230	0
Acute Myocardial Infarction with execution of PTCA within 2 days: mortality at 30 days	0.38	0.177	0	1.25	0.000	1	0.57	0.136	0
Surgery for TM lung: 30-day mortality	1.38	0.341	0	0.98	0.953	0	0.86	0.722	0
5) Istituto Clinico Mater Domini - Casa Di Cura Privata Spa Castellanza (Northern Italy)									
Acute myocardial infarction: 30-day mortality	0.72	0.463	0	0.57	0.274	0	0.79	0.514	0
TM kidney surgery: 30-day mortality	1.19	0.862	0	-	-	-	-	-	-
Congestive heart failure: 30-day mortality	1.10	0.683	0	1.22	0.413	0	1.39	0.541	0
Femoral neck fracture: 30-day mortality	0.61	0.486	0	0.22	0.136	0	0.50	0.327	0
COPD exacerbated: 30-day mortality	0.92	0.834	0	1.47	0.178	0	1.51	0.130	0
TM colon surgery: 30-day mortality	0.32	0.263	0	0.53	0.382	0	0.32	0.267	0
Acute Myocardial Infarction with execution of PTCA within 2 days: mortality at 30 days	0.36	0.317	0	-	-	-	1.14	0.797	0
6) Policlinico Universitario Campus Bio-Medico di Roma (Center of Italy)									
TM kidney surgery: 30-day mortality	1.46	0.605	0	1.61	0.505	0	1.83	0.399	0
Surgery for TM pancreas: 30-day mortality	2.29	0.090	0	1.38	0.646	0	0.93	0.918	0
Surgery for liver TM: 30-day mortality	0.70	0.726	0	1.50	0.573	0			
Isolated Aortocoronary bypass: 30-day mortality	1.11	0.755	0	1.12	0.740	0	1.90	0.036	1
Valvuloplasty or replacement of heart valves: 30-day mortality	0.51	0.128	0	0.83	0.609	0	1.14	0.720	0
Congestive heart failure: 30-day mortality	0.72	0.389	0	0.32	0.050	0	0.37	0.003	1
Repair of unbroken abdominal aortic aneurysm: 30-day mortality	0.77	0.790	0	1.51	0.477	0	0.91	0.894	0
TM stomach surgery: 30-day mortality	1.68	0.238	0	1.13	0.836	0	1.05	0.932	0
TM colon surgery: 30-day mortality	0.38	0.189	0	0.45	0.279	0	0.21	0.127	0
Rectal TM surgery: 30-day mortality	1.69	0.472	0	1.44	0.615	0	0.82	0.844	0
Surgery for TM lung: 30-day mortality	2.45	0.074	0	2.12	0.098	0	-	-	-

Table 1. Outcome of Accredited Joint Commission Organizations in Italy. Relative Risk (RR) and p-value

5. Discussion

The PNE develops in the Italian Health Service the evaluation of the outcomes of health surgical procedures. These can be defined as the estimate, with observational (non-experimental) study designs, of results of health treatments. The main objectives of PNE concern the comparative evaluation between providers. It is indeed useful in identifying weaknesses, consequences on the accreditation conditions, differences due to geographical location and consequently and finally fairness in health cares access.

The analysis of the performance of healthcare activities on the basis of the thirty-day mortality index, allows to evaluate the structure position, the relative risk and the relative p-value of significance with respect to the national average. This was done taking into account the volume of performance and other determining factors of the index itself.

The analysis conducted over three years shows the lack of a sufficient degree of significance despite the level of performance being almost always better than the national average.

Therefore, it is not possible to claim that accredited health facilities by the *Joint Commission International (JCI)* are better than the others belonging to the Italian health system. Non-accredited healthcare structures figure out performance similar to the one of JCI accredited facilities. There is no significant difference.

The results clearly show the existence of an inverse correlation between the structural features of the national health systems where JCI accredited facilities are located and the relevance of certification as a tool for differentiation. The stronger the first, the lower can be expected to be the second. Italy is among the top countries in terms of care performance. Minimum standards (or *LEA – Livelli Essenziali di Assistenza*) are defined, compulsory and marked out in each district. The Italian health system requires LEA to be implemented by every single facility to guarantee patient safety (France, Taroni and Donatini, 2005). At the same time they represent services that the Italian National Health Service (SSN) provides to all citizens, free of any direct charge or upon payment of a flat fee and financed with the public resources collected through the general taxation (Turati, 2013). The Italian Health Service in fact bases its fundamental principles (Law 833 of 1978) on universality, equal rights and fairness (Guillén, 2002). Since 1978, in Italy, there has been a transition from a mutual system or Bismarck model to a Beveridge model, which in any case factually affects the approach to access to care and accreditation of the health system based on minimum principles and standards (Cichon and Normand, 1994; Simonet, 2009). The American model instead needs a certification for the determination of minimum levels to guarantee the security of access to adequate care as it is based on a neoliberals free-market model (Saad-Filho, 2019).

Universality means an extension of health services to the whole population in compliance with art. 32 of the Italian Constitution that literally says: "*The Republic protects health as a fundamental right of the individual and an interest of the community, and guarantees free care to the poor*". Health has considered to be not only as an individual good but above all as a community resource (Ferrera, 1995). Starting from 1978, the NHS applies this principle through the promotion, maintenance, and recovery of the physical and mental health of the entire population with a widespread organization throughout the country whose services are provided by local health companies, hospital companies, and private affiliated structures with the SSN. All of this facility together aim at uniformly guarantee the Essential Levels of Assistance (LEA) to the entire population.

Equal rights mean that citizens must be able to access the NHS services without any individual, social and economic distinction. Citizens, who do not belong to exempt categories, are required to pay a flat fee – called "ticket" – that varies for each service provided by the LEA. Finally, equal rights mean guarantee of equal health care access in relation to equal health needs. This main basic principle aims to overcome citizens' inequalities allowing to everybody access to health services.

To recognize equal rights to citizens it is necessary to guarantee fairness that means quality, efficiency, appropriateness and transparency of the service. A fair communication on the Health Service itself is necessary for the citizens. It has to be adequate for his level of education and understanding (informed consent, taking charge) and has to be prepared and provided by doctors, nurses and health workers.

The principles discussed inform the Italian culture and have over time pushed the Italian Healthcare System to guarantee minimum quality standards. The impact on our research is relevant as we saw that it led to not having statistically significant differences between accredited *Joint Commission International* structures and national averages.

It sounds interesting to point out that the JCI accreditation process did not reveal any real improvement even in the American countries where the system is more widespread and constrains the public funding of the Medicare programs (Griffith, Knutzen and Alexander, 2002; Lam et al., 2018).

Therefore, the JCI system seems to find optimal application in countries where no structured health system and rigid controls based on standards aimed at patient health have not been implemented yet. An example is the Asian countries where, although medical tourism is widespread, without accreditation, it would not be possible to pinpoint high level facilities and consequently to guarantee patient safety standards comparable to the levels of western countries (Gupta, Verhoeven and Tiongson, 2003).

6. Conclusion

The study proves that there are no differences in performance between structures accredited according to standards by the *Joint Commission International* and Italian structures.

It should be noted that in Italy the guarantee of the patients is guaranteed in any case by the minimum levels of care (LEA) (Brescia et al., 2017; Campra et al., 2019). The national outcomes program based on comparative effectiveness research, although there are no differences between accredited and non-accredited structures, is nonetheless supportive for carrying out an evaluation of the performance trend compared to the national average. It allows indeed a push towards continuous improvement and redefinition of standards specific for health services.

If health services are guaranteed throughout Italy, albeit with regional differences, then it is possible to affirm that medical tourism and hospitality can be guaranteed regardless of accreditation according to standards defined by the Joint Commission.

Future analyzes should however verify the same assumptions in similar European health systems. It will be necessary to consider the different health systems characteristics and to group them into three main categories – public, private or mixed – considering the country main settings.

The analysis conducted can be helpful for American policymakers, managers, and insurance companies who should guide their choices rather than on standards accredited by the Joint Commission International from the evaluation of individual national culture and settings.

Accreditation seems not to be necessarily synonymous of higher quality. It requires anyway time and higher costs so that not all structures get involved in it. This takes to a kind of adverse selection sometimes excluding good structures from the medical tourism facilities carnet (Greenfield and Braithwaite, 2009; Mumford et al., 2013).

The study can also provide some first indications that can be usefully replicated in other European countries regarding on one hand the expected facilities quality in different European context and on the other tourism and healthcare mobility in Europe. The last research field as been explicitly mentioned in Directive 2011/24/EU entitled "*Patients' rights in cross-border healthcare*".

Finally, despite mortality index, qualitative perception data were not available for the Italian context. The provision and disclosure of information divided by each facility and useful to carry out the same tests and comparisons already implemented in America and in other countries could enable to improve the analysis. For this reason, it is suggested to investigate further in the future, if and when those data-set will be accessible, the phenomenon of quality assessment in health systems in the Italian context.

References

[1] Affeldt, J. E. (1980). 'The new quality assurance standard of the joint commission on accreditation of hospitals', *Western Journal of Medicine*. BMJ Publishing Group, 132(2), p. 166.

[2] Afifi, A. A. and Elashoff, R. M. (1967). 'Missing observations in multivariate statistics II. Point estimation in simple linear regression', *Journal of the American Statistical Association*. Taylor & Francis, 62(317), pp. 10-29.

[3] Alkhenizan, A. and Shaw, C. (2011). 'Impact of accreditation on the quality of healthcare services: a systematic review of the literature', *Annals of Saudi medicine*. King Faisal Specialist Hospital & Research Centre, 31(4), pp. 407-416.

[4] Ansari, Z., Laditka, J. N. and Laditka, S. B. (2006). 'Access to health care and hospitalization for ambulatory care sensitive conditions', *Medical care research and review*. Sage Publications Sage CA: Thousand Oaks, CA, 63(6), pp. 719-741.

[5] Arcari, G. (2003). 'Il processo di accreditamento e le logiche della qualità nel metodo Joint Commission International', *Giornale di Tecniche Nefrologiche & Dialitiche*, 15(1).

[6] Bailar, J. C. and Hoaglin, D. C. (2012). *Medical uses of statistics*. John Wiley & Sons.

[7] Baker, S. L. et al. (2007). 'The role of performance management and quality improvement in a national voluntary public health accreditation system', *Journal of Public Health Management and Practice*. LWW, 13(4), pp. 427-429.

[8] Baretich, M. F. (2020). 'Hospital safety programs', in *Clinical Engineering Handbook*. Elsevier, pp. 349-352.

[9] Barlow, W. E. and Prentice, R. L. (1988). 'Residuals for relative risk regression', *Biometrika*. Oxford University Press, 75(1), pp. 65-74.

[10] Biancone, P. P. et al. (2020). 'Redefining the Conceptual Framework for Quality of Care', *Quality-Access to Success*, 21(174), pp. 40-48.

[11] Birkmeyer, J. D. et al. (2002). 'Hospital volume and surgical mortality in the United States', *New England Journal of Medicine*. Mass Medical Soc, 346(15), pp. 1128-1137.

[12] Bode, I. (2006). 'Disorganized welfare mixes: voluntary agencies and new governance regimes in Western Europe', *Journal of European social policy*. Sage Publications Sage CA: Thousand Oaks, CA, 16(4), pp. 346-359.

[13] Brescia, V. et al. (2017). 'Italian Health Care System: Methodology Suggestion for the Financial Equilibrium and Essential Level of Care', *Business, Management and Economics Research*. Academic Research Publishing Group, 3(4), pp. 40-51.

[14] Campra, M. et al. (2019). 'Redefining the New Public Management and Effects of Indicators: Sustainable Healthcare Mobility', *Journal of Management and Sustainability*, 9(1), pp. 141-158.

[15] Chae, Y. M. et al. (2003). 'Analysis of healthcare quality indicator using data mining and decision support system', *Expert Systems with Applications*. Elsevier, 24(2), pp. 167-172.

[16] Cichon, M. and Normand, C. (1994). 'Between Beveridge and Bismarck: options for health care financing in Central and Eastern Europe', in *World health forum 1994*; 15 (4): 323-328.

[17] Devereaux, P. J. et al. (2012). 'Association between postoperative troponin levels and 30-day mortality among patients undergoing noncardiac surgery', *Jama*, 307(21), pp. 2295-2304.

[18] Donabedian, A. (1981). 'Criteria, norms and standards of quality: what do they mean?', *American Journal of Public Health*. American Public Health Association, 71(4), pp. 409-412.

[19] Donahue, K. T. and Vanostenberg, P. (2000). 'Joint Commission International accreditation: relationship to four models of evaluation', *International journal for quality in health care*. Oxford University Press, 12(3), pp. 243-246.

[20] Douglas, T. J. and Fredendall, L. D. (2004). 'Evaluating the Deming management model of total quality in services', *Decision Sciences*. Wiley Online Library, 35(3), pp. 393-422.

[21] Dyer, J. S. and Sarin, R. K. (1982). 'Relative risk aversion', *Management Science*. INFORMS, 28(8), pp. 875-886.

[22] Epstein, A. M. (1998). 'Rolling down the runway: the challenges ahead for quality report cards', *Jama*. American Medical Association, 279(21), pp. 1691-1696.

[23] Ferrera, M. (1995). 'The rise and fall of democratic universalism: health care reform in Italy, 1978-1994', *Journal of Health Politics*, Policy and Law. Duke University Press, 20(2), pp. 275-302.

[24] France, G., Taroni, F. and Donatini, A. (2005). 'The Italian health-care system', *Health economics*. Wiley Online Library, 14(S1), pp. S187-S202.

[25] Garber, A. M. (1992). 'Economic foundations of cost-effectiveness analysis', *Working paper series-Natl Bureau Econ Res*, 4164, pp. 1-34.

[26] Gargon, E., Gorst, S. L. and Williamson, P. R. (2019). 'Choosing important health outcomes for comparative effectiveness research: 5th annual update to a systematic review of core outcome sets for research', *PloS one*. Public Library of Science, 14(12).

[27] Ghaferi, A. A., Birkmeyer, J. D. and Dimick, J. B. (2011). 'Hospital volume and failure to rescue with high-risk surgery', *Medical care*. JSTOR, pp. 1076-1081.

[28] Goldstein, H. and Spiegelhalter, D. J. (1996). 'League tables and their limitations: statistical issues in comparisons of institutional performance', *Journal of the Royal Statistical Society: Series A (Statistics in Society)*. Wiley Online Library, 159(3), pp. 385-409.

[29] Greenfield, D. and Braithwaite, J. (2009). *Developing the evidence base for accreditation of healthcare organisations: a call for transparency and innovation*. BMJ Publishing Group Ltd.

[30] Griffith, J. R., Knutzen, S. R. and Alexander, J. A. (2002). 'Structural versus outcomes measures in hospitals: a comparison of Joint Commission and Medicare outcomes scores in hospitals', *Quality Management in Healthcare*. LWW, 10(2), pp. 29-38.

[31] Gryfe, C. I., Amies, A. and Ashley, M. J. (1977). 'A longitudinal study of falls in an elderly population: I. Incidence and morbidity', *Age and ageing*. Oxford University Press, 6(4), pp. 201-210.

[32] Guillén, A. M. (2002). 'The politics of universalisation: establishing national health services in Southern Europe', *West European Politics*. Taylor & Francis, 25(4), pp. 49-68.

[33] Gupta, S., Verhoeven, M. and Tiongson, E. R. (2003). 'Public spending on health care and the poor', *Health economics*. Wiley Online Library, 12(8), pp. 685-696.

[34] Halm, E. A., Lee, C. and Chassin, M. R. (2002). 'Is volume related to outcome in health care? A systematic review and methodologic critique of the literature', *Annals of internal medicine*. American College of Physicians, 137(6), pp. 511-520.

[35] Hernán, M. A. (2011). 'With great data comes great responsibility: publishing comparative effectiveness research in epidemiology', *Epidemiology (Cambridge, Mass.)*. NIH Public Access, 22(3), p. 290.

[36] Heung, V. C. S., Kucukusta, D. and Song, H. (2011). 'Medical tourism development in Hong Kong: An assessment of the barriers', *Tourism Management*, 32(5), pp. 995-1005. doi: 10.1016/j.tourman.2010.08.012.

[37] Jost, T. S. (1994). 'Medicare and the Joint Commission on Accreditation of Healthcare Organizations: a healthy relationship?', *Law and contemporary problems*. JSTOR, 57(4), pp. 15-45.

[38] Kwan, A. et al. (2019). 'Use of standardised patients for healthcare quality research in low-and middle-income countries', *BMJ global health*. BMJ Specialist Journals, 4(5), p. e001669.

[39] Lam, M. B. et al. (2018). 'Association between patient outcomes and accreditation in US hospitals: observational study', *BMJ*. British Medical Journal Publishing Group, 363, p. k4011.

[40] Landis, W. G. (2004). *Regional scale ecological risk assessment: using the relative risk model*. CRC Press.

[41] Legido-Quigley, H. and Nolte, E. (2008). *Assuring the quality of health care in the European Union: a case for action*. World Health Organization (12).

[42] Lemarquand, D. (1993). 'The International Joint Commission and changing Canada–United States boundary relations', *Natural Resources Journal*. JSTOR, 33(1), pp. 59-91.

[43] de Lemos, J. A. and Nallamothu, B. K. (2020). 'The Challenges of Observational Comparative Effectiveness Research', *Circulation*. Am Heart Assoc, 141(4), pp. 237-239.
[44] Leyland, A. H. and Boddy, F. A. (1997). 'Measuring performance in hospital care. Length of stay in gynaecology'. *European Journal of Public Health*, 7(2), pp. 136-143. (doi:10.1093/eurpub/7.2.136).
[45] Lillrank, P. and Liukko, M. (2004). 'Standard, routine and non-routine processes in health care', *International journal of health care quality assurance*. 17(1):39-46. https://doi.org/10.1108/09526860410515927. Emerald Group Publishing Limited.
[46] Longo, R. et al. (2017). 'On the security of the blockchain BIX protocol and certificates', in *International Conference on Cyber Conflict, CYCON*, pp. 1-16. doi: 10.23919/CYCON.2017.8240338.
[47] Marill, K. A. (2004). 'Advanced statistics: linear regression, part II: multiple linear regression', *Academic emergency medicine*. Wiley Online Library, 11(1), pp. 94-102.
[48] Marshall, E. C. and Spiegelhalter, D. J. (1999). *Strategies for inference robustness in complex modelling: An application to longitudinal performance measures*. Citeseer.
[49] Marshall, E. C. and Spiegelhalter, D. J. (2001). 'Institutional performance', *Multilevel modelling of health statistics*, pp. 127-142. Wiley Series in Probability and Statistics, John Wiley & Sons, Chichester.
[50] McGreevey, C., Nadzam, D. and Corbin, L. (1997). 'The Joint Commission on Accreditation of Healthcare Organizations' Indicator Measurement System. Health care outcomes database', *Computers in nursing*, 15(2 Suppl), pp. S87-94.
[51] McIntyre, D., Rogers, L. and Heier, E. J. (2001). 'Overview, history, and objectives of performance measurement', *Health Care Financing Review*. Centers for Medicare and Medicaid Services, 22(3), p. 7.
[52] Miettinen, O. S. (1970). 'Estimation of relative risk from individually matched series', *Biometrics*. JSTOR, 26, pp. 75-86.
[53] Mitchell, P. H. (2008). 'Defining patient safety and quality care', in *Patient safety and quality: An evidence-based handbook for nurses*. Agency for Healthcare Research and Quality (US).
[54] Morath, J. M. and Turnbull, J. E. (2005). *To do no harm: ensuring patient safety in health care organizations*. John Wiley & Sons.
[55] Mosadeghrad, A. M. (2014). 'Factors influencing healthcare service quality', *International journal of health policy and management*, 3(2), p. 77.
[56] Mumford, V. et al. (2013). 'Health services accreditation: what is the evidence that the benefits justify the costs?', *International Journal for Quality in Health Care*. Oxford University Press, 25(5), pp. 606-620.
[57] Nadzam, D. M. (1991). 'Development of medication-use indicators by the Joint Commission on Accreditation of Healthcare Organizations', *American Journal of Hospital Pharmacy*. Oxford University Press, 48(9), pp. 1925-1930.
[58] Pafford, B. (2009). 'The third wave–medical tourism in the 21st century.', *Southern medical journal*, 102(8), pp. 810-813.
[59] Parvizi, J., Ereth, M. H. and Lewallen, D. G. (2004). 'Thirty-day mortality following hip arthroplasty for acute fracture', *JBJS*. LWW, 86(9), pp. 1983-1988.
[60] Reeves, C. A. and Bednar, D. A. (1994). 'Defining quality: alternatives and implications', *Academy of management Review*, 19(3), pp. 419-445. Academy of Management Briarcliff Manor, NY 10510.
[61] Reid, C. et al. (2009). 'An Australian risk prediction model for 30-day mortality after isolated coronary artery bypass: the AusSCORE', *The Journal of thoracic and cardiovascular surgery*. Elsevier, 138(4), pp. 904-910.
[62] Roberts, J. S., Coale, J. G. and Redman, R. R. (1987). 'A history of the Joint Commission on Accreditation of Hospitals', *Jama*. American Medical Association, 258(7), pp. 936-940.
[63] Robinson, R. (1995). *Accrediting hospitals*. British Medical Journal Publishing Group.
[64] Saad-Filho, A. (2019). 'Crisis in neoliberalism or crisis of neoliberalism?', in *Value and Crisis: Essays on Labour, Money and Contemporary Capitalism*. Brill, pp. 302-318.
[65] Simonet, D. (2009). 'Changes in the delivery of primary care and in private insurers' role in United Kingdom, Italy, Germany, Switzerland and France', *Journal of Medical Marketing*, 9(2), pp. 96-103. SAGE Publications Sage UK: London, England.
[66] Smith, P. C. and Forgione, D. A. (2007). 'Global outsourcing of healthcare: a medical tourism decision model', *Journal of Information Technology Case and Application Research*, 9(3), pp. 19-30, Taylor & Francis.
[67] Thomas, N., Longford, N. T. and Rolph, J. E. (1994). 'Empirical Bayes methods for estimating hospital-specific mortality rates', *Statistics in medicine*, 13(9), pp. 889-903, Wiley Online Library.
[68] Tradori, Brescia, V. and Biancone, P. (2019). 'Dal concetto di qualità multidisciplinare in sanità a un modello di verifica', *Economia Aziendale Online 2000 Web*, 10(4): 607-625. DOI: 10.13132/2038-5498/10.4.1998
[69] Tu, J. V. et al. (2003). 'Introduction to the Canadian Cardiovascular Outcomes Research Team's (CCORT) Canadian Cardiovascular Atlas project', *Canadian journal of cardiology*. Citeseer, 19(3), pp. 225-230.
[70] Turati, G. (2013). 'The Italian Servizio Sanitario Nazionale: a renewing tale of lost promises', in *Federalism and decentralization in European health and social care*, pp. 47-66. Springer.
[71] Wachter, R. M. (2010). 'Patient safety at ten: unmistakable progress, troubling gaps', Health affairs, 29(1), pp. 165-173.
[72] York, D. (2008). 'Medical tourism: the trend toward outsourcing medical procedures to foreign countries', *Journal of Continuing Education in the Health Professions*, 28(2), pp. 99-102, Wiley Online Library.
[73] Yousefian, S. et al. (2013). 'A proposed adaptation of joint commission international accreditation standards for hospital – JCI to the health care excellence model', *Advances in Environmental Biology*, pp. 956-968, American-Eurasian Network for Scientific Information.

The Influence of Service Quality, Brand Image, and Store Atmosphere on Customer Loyalty through Customer Satisfaction at Indomaret Plus Jember

Diah YULISETIARINI[1*], Tita Dicky MAWARNI[2]

[1,2]Faculty of Economics and Business, University of Jember, Indonesia
[*]Corresponding author; E-mail: diahyuli@unej.ac.id

Abstract

This study aims to determine the influence of service quality, brand image, and store atmosphere on customer loyalty through customer satisfaction at Indomaret Plus Jember. The research sample consisted of 100 respondents who were at least 18 years old and had spent at least twice at Indomaret Plus. Data collection techniques using online and offline questionnaires. The analytical method used is path analysis. The results showed that service quality, brand image, and store atmosphere had a direct effect on customer satisfaction. Customer satisfaction has a direct effect on customer loyalty. Service quality, brand image, and store atmosphere have an indirect effect on consumer loyalty. Service quality provides the greatest influence on customer loyalty.

Keywords: *service quality; brand image; store atmosphere; customer satisfaction; customer loyalty.*

1. Introduction

Retail is one of the trade sectors that has a large contribution to the economy in Indonesia. Retail is the business activity of trading goods or services directly to end consumers (Tjiptono 2008: 191). The national retail business is spread throughout all regions in Indonesia. One of the largest retail businesses in Indonesia is Indomaret. Indomaret is a trademark owned by PT. Indomarco Prismatama. Jember is a city that has Indomaret Plus outlets.

Indomaret consists of three types in Jember, namely Indomaret, Indomaret Plus, and Indomaret Point. The object of this research is Indomaret Plus. The difference between Indomaret Plus and other Indomaret lies in the greater diversity of products, strategic location, and other facilities such as the live acoustic area and WIFI corner. Based on preliminary observations and surveys conducted, Indomaret Plus Jember has several problems, including employees who get consumer complaints about the price difference between the price tag and the cashier; an acoustic live area that cannot be used, and declining sales turnover.

PT. Indomarco Prismatama, as the parent company of Indomaret, experienced a decline in profit, which was quite declining in 2017 by 71.03% (detikfinance.com, 2017). Based on this, Indomaret Plus Jember needs to make improvements and development to increase profits and be able to compete with other retailers. Customer satisfaction is proven to have the greatest effect on customer loyalty (Andriana et al. 2019). According to Limakrisna and Palurian (2017) states, satisfaction is proven to increase loyalty so that the company is able to obtain high profits. Utami (2006: 252) states that service quality is the main driver of customer loyalty. Good service quality has an influence on consumer satisfaction and ultimately increases customer loyalty (Afthanorhan et al. (2019); Paramita and Sahid (2014); Yulisetiarini, 2013; Shanka, 2012; Caruana, 2002). Mosahab et al. (2010) also states that customer satisfaction is proven to have a major influence on customer loyalty. Brand image is one of the determinants of the success of a type of service (Yulisetiarini and Ade, 2019). According to Fitriana and Made (2018), a strong brand image enables a company to increase its profits. Tu et al. (2012); Amanah (2011); Ogba and Zhenzhen (2009); Hung (2008) states the company's brand image significantly influences customer satisfaction and customer loyalty, and customer satisfaction has a strong impact on customer loyalty. According to Hussain and Mazhar (2015), the store atmosphere in the form of store cleanliness, sound, lighting, and product layout can increase consumer interest in making purchases. Alfin and Sahidillah (2017); Andriyana (2017); Dwi and Agus (2016); Irena and Sugiono (2015); Harianto and Subagio (2013) state that the store atmosphere has a direct effect on customer satisfaction and the store atmosphere has an indirect effect on customer loyalty.

2. Literature Review

Service quality is a consumer's assessment of real experiences that can be perceived as appropriate services and can exceed consumer expectations (Kotler and Keller, 2016: 155; Sangadji and Sopiah, 2013: 100; Wijaya, 2011: 11). Mehta et al. (2000) put forward the attribute dimensions in assessing service quality in retail businesses, including service personnel, physical aspects, merchandise, trustworthiness, and parking.

Brand image is a perception that is in the minds of consumers in a brand that has been felt and experienced both directly and indirectly obtained from friends, family, or other media. (Fitriana and Made, 2018; Tjiptono, 2011: 23). According to Keller (2017: 78), the factors that shape brand image are as follows:

1. strength of brand associations;

2. favorability of brand association, and
3. uniqueness of brand associations.

Store atmosphere is one of the marketing management strategies related to the creation of a store atmosphere relating to building design, interior spaces, hallway layout, carpet and wall texture, odor, color, shape, and sound experienced by consumers in an effort to exert influence on consumers to make purchases (Utami, 2006: 127; Mowen and Michael, 2002: 139). According to Levy and Barton (2001: 118), the store atmosphere consists of two things, namely the in store atmosphere and the out store atmosphere:

1. in store atmosphere, namely settings in the room that concern: internal layout; sound; smell; texture; and building interior design;
2. out store atmosphere, namely outdoor arrangements involving: external layout; texture and exterior design of buildings.

Customer satisfaction is an assessment by consumers of the use of a product or service where the product can meet their expectations and needs (Kotler and Keller, 2016: 153; Sunyoto, 2013: 35; Tjiptono, 2008: 24). According to Yuliarmi and Putu (2007), there are three indicators that can be used to measure customer satisfaction consisting of conformity of expectations, level of satisfaction, and complaints or complaints posted against the company.

Customer loyalty is a commitment of consumers in the use of a company's product or service so that it tends to repurchase and recommend company products to their partners (Lovelock and Jochen, 2010: 76; Sopiah, and Syihabudin, 2008: 105; Utami, 2006: 58). Companies that have loyal customers are important in maintaining the profits of competitors. According to Sopiah and Syihabudhin (2008: 105), loyal consumers have the following characteristics:

1. make purchases regularly;
2. make a purchase on all product or service lines;
3. recommend other products, and
4. shows the immunity of the attractiveness of similar products from competitors.

3. Research Methods

The study was conducted at Indomaret Plus Jember. The population in this study were all customers of Indomaret Plus Jember. The sample in this study was that some Indomaret Plus customers met several criteria, namely respondents aged at least 18 years and respondents had made purchases at least twice at Indomaret Plus Jember. The number of respondents in this study was 100 people. Data collection techniques using a questionnaire with a spread ratio of 50 online and 50 offline. The study was conducted from October to December 2019. The analysis tool used in this study was path analysis. Path analysis examines the direct effect of service quality, brand image, and store atmosphere on customer satisfaction and tests the indirect effect of service quality, brand image, and store atmosphere on customer loyalty.

4. Result and Discussion

Figure 1 states that service quality (X_1) directly influences customer satisfaction (Z) with a beta value of 0.367, brand image (X_2) has a direct effect on consumer satisfaction (Z) with a beta value of 0.350, store atmosphere (X_3) has a direct effect on consumer satisfaction (Z) with a beta value of 0.228. Service quality (X_1) has a direct effect on consumer loyalty (Y) with a beta value of 0.488, brand image (X_2) has a direct effect on consumer loyalty (Y) with a beta value of 0.166, the store atmosphere (X_3) has a direct effect on consumer loyalty (Y) with a beta value of 0.124, and customer satisfaction (Z) directly affect consumer loyalty (Y) with a beta value of 0.278. Based on these data, service quality variables provide the greatest direct effect on consumer loyalty of 0.488. The effect of total service quality (X_1) on customer loyalty (Y) through customer satisfaction (Z) of 0.590. The effect of total service quality (X_2) on customer loyalty (Y) through customer satisfaction (Z) of 0.263. The effect of total service quality (X_3) on customer loyalty (Y) through customer satisfaction (Z) of 0.187.

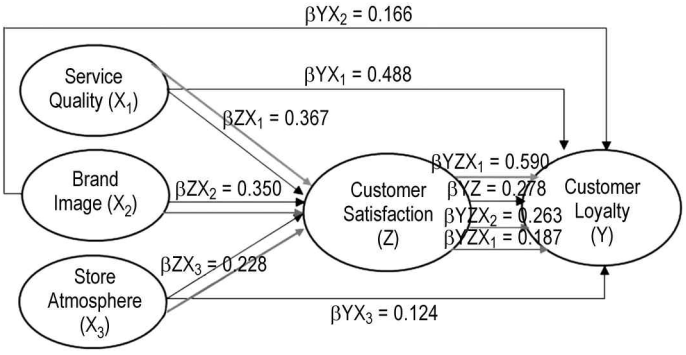


Figure 1.Path Analysis

Based on this, the direct effect of service quality (X_1), brand image (X_2), and store atmosphere (X_3) on consumer loyalty (Y) has a path coefficient value greater than the indirect effect of service quality (X_1), brand image (X_2) and store atmosphere (X_3) towards consumer loyalty (Y), so that customer satisfaction (Z) has a small mediating role. Service quality has the biggest direct effect on customer loyalty, meaning that the quality of service by consumers states loyal without having to declare satisfaction.

The results showed that service quality has the most significant and significant influence on customer satisfaction, meaning that the better the quality of service, customer satisfaction will increase. This is in line with previous research supporting Rahman (2019); Yulisetiarini and Ade (2019); Sari et al. (2016); Heryati (2015); Saidani andSamsul (2012); and Sureshchandar, et al. (2002) which states that service quality has a significant effect on customer satisfaction. Consumers are satisfied with the quality of services provided by employees, are ready to respond to consumer demand, and the layout of goods makes it easy for consumers to pick it up.

Brand image has a significant influence on customer satisfaction, meaning that the better the brand image, customer satisfaction will increase. The results of this study are in line with research conducted by Yulisetiarini and Ade (2019); Irmawati et al. (2017); Rizky (2016); and Malik, et al. (2012) states brand image has a significant effect on customer satisfaction. Consumers say that the private label product brands in Indomaret Plus Jember are guaranteed quality.

The results showed the store's atmosphere had a significant effect on customer satisfaction. The results of this study are in line with research conducted by Rahman (2019); Alfin and Sahidillah (2017); Andriyana (2017); Heryati (2015); Harianto and Subagio (2013) state that the store atmosphere has a significant effect on customer satisfaction, meaning that the better the atmosphere of the store, the customer satisfaction will increase. Indomaret Plus Jember customers will be interested in visiting and making purchases because they have enough seats in front of the store, the side of the store, and the WI-FI corner is sitting area.

The results showed that service quality has a significant effect on customer loyalty, meaning that the better the quality of service, the higher the level of customer loyalty. The results of this study are in line with previous studies conducted by and Heryati (2015); Budiono and Yohanes (2014); Yulisetiarini (2013); Santouridis and Trivellas (2010) stated that service quality has a significant effect on consumer loyalty. Diverse products make consumers make repeat purchases.

Research shows that brand image has a significant effect on

consumer loyalty, meaning that the better the brand image, the higher the customer loyalty. The results of this study are in line with previous studies conducted by Rizky (2016); Amanah (2011); Ogba and Zhenzhen (2009); and Hung (2008) state that brand image has a significant effect on consumer loyalty. The Indomaret Plus Jember brand is well known for having a competitive advantage.

The shop atmosphere influences the consumer satisfaction of Indomaret Plus Jember. This means that the better the atmosphere of the store, customer satisfaction will increase. The results of this study are in line with previous studies conducted by Alfin and Sahidillah (2017); Dwi and Agus (2016); Irena and Sugiono (2015) state that the store atmosphere has a significant effect on consumer loyalty. Cool store atmosphere and bright lighting add to the convenience of consumers in shopping.

The results showed that customer satisfaction had a significant effect on consumer loyalty, meaning that the more consumers felt satisfied, the higher the level of customer loyalty. The results of this study are in line with previous studies conducted by Yulisetiarini and Susanto (2018); Alfin and Sahidillah (2017); Rizky (2016); Irena and Sugiono (2015); Paramita and Sahid (2014); Kandampully and Dwi (2000) state that customer satisfaction has a significant effect on customer loyalty. Consumers are satisfied with the performance given by Indomaret Plus Jember, which is better than other retailers.

The results of the regression coefficient indicate that there is a positive mediation or intervening relationship so that service quality can be interpreted as having a significant effect on customer loyalty through customer satisfaction. The results of this study are in line with previous studies conducted by. Yulisetiarini (2015); Shanka (2012); and Caruana (2002) showed that service quality has a significant effect on customer loyalty through customer satisfaction. Indomaret Plus Jember employees are ready to help and respond to consumer demand. Products at Indomaret Plus Jember are neatly arranged according to the needs of consumers. Products at the diverse Indomaret Plus Jember and large parking areas can attract consumers to shop at Indomaret Plus Jember. The quality of Indomaret Plus Jember services that are already good and appropriate can increase the probability of respondents to be loyal.

The results showed the regression coefficient there is a positive mediation or intervening relationship so that it can be interpreted that the brand image influences consumer loyalty through customer satisfaction. The results of this study are in line with previous studies conducted by Rizky (2016); and Tu et al. (2012) shows brand image has a significant effect on consumer loyalty through customer satisfaction. The product brands sold at Indomaret Plus Jember are well-known in the community so that consumers have no doubt about their quality. The quality of these products can be a competitive advantage of Indomaret Plus Jember against other retailers that sell similar products. Indomaret Plus Jember brand image, which has been good and appropriate, can increase the probability of respondents to be loyal.

The results showed the regression coefficient there is a positive mediation or intervening relationship so that it can be interpreted that the store atmosphere influences consumer loyalty through customer satisfaction. The results of this study are in line with previous studies conducted by Alfin and Sahidillah (2017), and Novia (2015) showed that shop atmosphere has a significant effect on customer loyalty through customer satisfaction. Consumers feel safe because the Indomaret Plus Jember building is sturdy and looks modern from the outside. The location of Indomaret Plus Jember, which is close to the city center, makes Indomaret Plus Jember much traveled by the community so that it becomes a convenient place to shop or stop by because of the seats available at Indomaret Plus Jember are also quite a lot. The good and appropriate atmosphere of Indomaret Plus Jember store can increase the probability of respondents to be loyal.

5. Conclusion

Service quality has a significant effect on customer satisfaction. Brand image has a significant effect on customer satisfaction. The store atmosphere has a significant effect on customer satisfaction. Consumer satisfaction has a direct effect on consumer loyalty. Service quality, brand image, and store atmosphere have an indirect effect on consumer loyalty. Quality of service provides the greatest influence on consumer loyalty. The direct effect of service quality on customer loyalty is greater than the indirect effect of service quality on customer loyalty, meaning that the mediating role of customer satisfaction is small.

References

[1] Afthanorhan, Asyraf, HazimiFoziah, RosnorzainiRusli, and Sofiah Khalid (2019). The Effect of Service Quality on Customer Satisfaction in Three Campuses of Unisa. *International Journal of Innovation, Creativity, and Change*. 7(10): 42-56.

[2] Alfin, Muhammad Reza, and Sahidillah Nurdin (2017). The Effect of Store Atmosphere on Customer Satisfaction that Implies Customer Loyalty. *Journal Ecodemica*. 1(2): 249-258.

[3] Amanah, Dita (2011). Effect of Promotion and Brand Image on Loyalty Purchase of Pepsodent Products at Ramayana Plaza, JalanAksara Medan. *Journal of Finance and Business*. 3(3): 221-233.

[4] Andriana, Ririn, Saparso, TomiFitrio, Emmywati, and Badaruddin (2019). The Relationship Between Corporate Reputation, Customer Satisfaction, Behavioural Intentions, and Customer Loyalty. *International Journal of Innovation, Creativity, and Change*. 9(4): 183-199.

[5] Andriyana, Rida (2017). Effect of Product Diversity, Store Atmosphere, and Location on Trimitra Mart Kediri Consumer Satisfaction. *Skripsi*: University of Nusantara Kediri. 1(9).

[6] Arikunto, Suharsimi (2006). *A Practical Research Procedure. Jakarta*: PT. AsdhiMahasatya.

[7] Budiono, Riswanto Jimanto, and Yohanes Sondang Kunto (2014). Effect of Service Quality on Customer Loyalty. *Journal of Marketing Management Petra*. 2(1): 1-7.

[8] Caruana, Albert (2002). Service Loyalty: The Effect of Service Quality and the Mediating Role of Customer Satisfaction. *European Journal of Marketing*. 36(7/8): 811-828.

[9] Detik Finance (2017). Indomaret Owner Net Profit Drops 71.03%. https://finance.detik.com/bursa-dan-valas/d-3581917/laba-bersih-pemilik-indomaret-anjlok-7103 [Accessed September 25, 2019].

[10] Dwi, Nuraisyah Purnamasari, and Agus Maolana Hidayat (2016). Analysis the Influence of Store Atmosphere on Customer Loyalty in Bandung Misbar Warung in 2016. *E-Proceeding of Applied Science*. 2(2): 441.

[11] Fitriana, Diana, and I Made Sukresna (2018). Analysis of the Effect of Brand Image, Product Quality, Price Fairness, and Customer Satisfaction on Customer Loyalty. *Diponegoro Journal of Management*. 7(3): 1-11.

[12] Ghozali, Imam (2016). Multivariate Analysis Application with the IBM SPSS 21 Program. Semarang: University of Diponegoro.

[13] Harianto, David,and Subagio Hartono (2013). Analysis of the Effect of Service Quality, Brand Image, and Atmosphere on Consumer Loyalty with Consumer Satisfaction as a Consumer Intervening Variable at Kedai Deja-Vu Surabaya. *Journal of Marketing Management*. 1(1): 1-8.

[14] Heryati, Euis (2015). Service Quality, Store Atmosphere, Private Brand towards Customer Satisfaction, and Loyalty of Hypermart Puri Jakarta. *Journal of Communication*. 12(1): 16-28.

[15] Hung, Chia-Hung (2008). The Effect of Brand Image on Public Relations Perceptions and Customer Loyalty. *International Journal of Management*. 25(2): 237.

[16] Hussain, Riaz, and Mazhar Ali (2015). Effect of Store Atmosphere on Customer Purchase Intention. *International Journal of Marketing Studies*. 7(2): 1-9.

[17] Irena, Florencia Sari Listiono,and Sugiono Sugiarto (2015). Effect of Store Atmosphere on Consumer Loyalty with Consumer

Satisfaction as an Intervening Variable in Liberia Eatery Surabaya. *Journal of Marketing Management Petra*. 1(1): 1-9.
[18] Irmawati, Herliana, Diah Yulisetiarini, and Deasy Wulandari (2017). The Effect of Location and Brand Image and Service Quality on Satisfaction in Medical Students of Jember University. *Journal of Management and Business*. 11(2): 155-163.
[19] Kandampully and Suhartanto (2000). Customer Loyalty in the Hotel Industry: The Role of Customer Satisfaction and Image. *International Journal of Contemporary Hospitality Management*. 12(6): 346-351.
[20] Keller, Kevin Lane (2017). *Strategic Brand Management: Building, Measuring, and Managing Brand Equity*. Global edition. United States of America: Pearson Education.
[21] Kotler, Philip, and Keller, K. L. (2016). *Marketing Management*. New Jersey: Pearson.
[22] Kuncoro, Mudrajad (2009). *Research Methods for Business & Economics*. Jakarta: Erlangga.
[23] Levy, Michael, and Barton A. Weitz (2001). *Retailing Management*, Fourth edition: Irwin Inc.
[24] Limakrisna, Nanda,and Palurian Togi (2017). *Marketing Management: Theory and Application in Business in Indonesia*. Jakarta: Mitra Wacana Media.
[25] Lovelock, Christopher, and Jochen Wirtz (2010). *Service Marketing – Indonesian Perspective*. Jilid 2. Seventh Edition. Jakarta: Erlangga.
[26] Malik, Muhammad Ehsan, Muhammad Mudasar Ghafoor, and Hafiz Kashif Iqbal (2012). Impact of Brand Image, Service Quality, and Price on Customer Satisfaction in Pakistan Telecommunication Sector. *International Journal of Business and Social Science*. 3(23): 123-129.
[27] Mehta, Subash, Ashok Lalwani, and Soon Li Han (2000). Services Quality in Retailing: Relative Efficiency of Alternative Measurement Scales for Different Product-Services Environments. *International Journal of Retail and Distribution Management*. 28(2): 62-72.
[28] Mosahab, Rahim, Osman Mahamad, and Ramayah (2010). Service Quality, Customer Satisfaction, and Loyalty: A Test of Mediation. *International Journal of Business Research*. 3(4): 72-80.
[29] Mowen, John and Michael Minor (2002). *Consumer behavior*. Jakarta: Erlangga.
[30] Murdijanto and Sunlip Wibisono (2010). *Quantitative Method Textbooks*. Jember: University of Jember.
[31] Novia (2015). *Effect of Service Quality, Brand Image, and Store Atmosphere on Consumer Loyalty through Zangradi Consumer Satisfaction in Surabaya*. Thesis: Widya Mandala Catholic University.
[32] Ogba, Ike-Elechi, and Zhenzhen Tan (2009). Exploring The Impact of Brand Image on Customer Loyalty and Commitment in China. *Journal of Technology Management*. 4(2): 132-144.
[33] Paramita, Cempaka, and SahidSusilo Nugroho (2014). Effect of Service Quality on Consumer Satisfaction and Loyalty in Online Spending (Product Involvement as Moderating). *Business Tactics Journal*. 18(1): 100-117.
[34] Rahman, Taufikur (2019). *Effect of Product Quality, Service Quality, Price, and Store Atmosphere on the Consumer Satisfaction of Department Store Transmart Jember*. Thesis: Marketing Management. Economics and Business. University of Jember.
[35] Rizky, Yudita Dwiyana Hawin (2016). *Effect of Brand Image on Loyalty through Consumer Satisfaction in the 3Second Distro in Jember Regency*. Thesis: Marketing Management. Economics and Business. University of Jember.
[36] Saidani, Basrah and Samsul Arifin (2012). The Influence of Product Quality and Service Quality on Consumer Satisfaction and Buying Interest in The Ranch Market. *Marketing Management Research Journal*. 3(1): 1-22.
[37] Santouridis, Illias,and Trivellas (2010). Investigating the Impact of Service Quality and Customer Satisfaction on Customer Loyalty in Mobile Telephone in Greece. *The TQM Journal*. 22(3): 330-343.
[38] Sari, Rini Kartika, Diah Yulisetiarini, and Sudaryanto (2016). The Effect of Price and Service Quality and Product Quality on Repurchase Interest and Online Shopping Customer Satisfaction in Abdurahman Saleh University Students Situbondo. *Journal of Business and Management*. 10(2): 115-126.
[39] Shanka, Mesay Sata (2012). Bank Service Quality, Customer Satisfaction, and Loyalty in Ethiopian Banking Sector. *Journal of Business Administration and Management Sciences Research*. 1(1): 001-009.
[40] Sopiah dan Syihabudhin (2008). *Retail Business Management*. Yogyakarta: CV. Andi Offset.
[41] Sunyoto, Danang (2013). *Questionnaire Theory and Data Analysis for Marketing and Consumer Behavior*. Yogyakarta: Graha Ilmu.
[42] Sureshchandar, Chandrasekharan Rajendran, and RN Anantharaman (2002). The Relationship between Service Quality and Customer Satisfaction – Factor specific approach. *Journal of Service Marketing*. 16(4): 363-379.
[43] Tjiptono, Fandy (2008). *Marketing Strategy*. Edition II Sixth Printing. Yogyakarta: CV Andi Offset.
[44] Tjiptono, Fandy (2011). *Brand Management and Strategy*. Yogyakarta: CV. Andi Offset.
[45] Tu, Yu-Te, Chin-Mei Wang, and Hsiao-Chien Chang (2012). Corporate Brand Image and Customer Satisfaction on Loyalty. J*ournal of Social and Development Sciences*. 3(1): 24-32.
[46] Utami, Christina Widya (2006). *Retail Management: Modern Retail Strategy and Implementation*. Jakarta: Salemba.
[47] Wijaya, Toni (2011). *Service Quality Management*. Jakarta: PT. Indeks.
[48] Yuliarmi, Ni Nyoman, and Putu Riyasa (2007). Analysis of Factors Affecting Customer Satisfaction with PDAM Services in Denpasar City. *Journal of Economic Study Bulletin*. 12(1): 9-28.
[49] Yulisetiarini, Diah (2013). The Role Of Service, Price, Promotion, Place, and Comfort on Customer Satisfaction and Switching Intention in Minimarket at Jember Regency. *International Research Journal of Finance & Economics*. 114: 24-32.
[50] Yulisetiarini, Diah (2015). Effects of Service Quality, Customer Satisfaction, and Loyalty. *Journal of Business and Management*. 9(1): 17-28.
[51] Yulisetiarini, Diah, and Arnis Budi Susanto (2018). Relationship Marketing: Satisfaction and Loyalty on Expedition Customers in Indonesia. *International Journal of Business and Management Science*. 8(3): 567-575.
[52] Yulisetiarini, Diah, and AdeYongky Prahasta (2019). The Effect of Price, Service Quality, Customer Value, and Brand Image on Customers Satisfaction of Telkomsel Cellular Operators in East Java, Indonesia. *International Journal of Scientific & Technology Research*. 8(3): 5-9.

Can Start-up Businesses Achieve Business Performance? An Overview of the "Soft" Total Quality Management Concept

Christina Whidya UTAMI[1], Timotius F.C.W. SUTRISNO[2], Teofilus TEOFILUS[3], Elia ARDYAN[4*]

[1]Universitas Ciputra Surabaya, Indonesia; E-mail: whidyautami@ciputra.ac.id
[2]Universitas Ciputra Surabaya, Indonesia; E-mail: timotius.febry@ciputra.ac.id
[3]Universitas Ciputra Surabaya, Indonesia; E-mail: teofilus@ciputra.ac.id
[4]Universitas Ciputra Surabaya, Indonesia; E-mail: elia.ardyan@ciputra.ac.id
[*]Corresponding author

Abstract

According to the literature, quality management consists of a series of critical components that have a purpose. This study test the impact of the "Soft" TQM aspects on the business performance of startups. To make it better understood by startup owners, construction models were made to show the situation of 171 startups in Surabaya regarding these elements. To achieve this goal, a literature review and a survey were conducted on 171 startups in two categories: technology and non-technology startups. The results of this study reflect that start-up companies must consider factual approaches, such as considering the quality of suppliers and the processes in them. The study also found that startups began to consider the needs of consumers rather than only focusing on an innovative dynamic solution as their main goal. This study shows the elements in the "Soft" aspects of TQM that are important to be maintained and made continuous improvements by the startups so that they have a competitive advantage.

Keywords: *total quality management; soft TQM; start-up business; business performance.*

1. Introduction

In today's competitive business environment, organizations need to evaluate their external and internal environment to see opportunities and challenges as one way to maintain their business performance [1]. Currently, business performance has been a center of attention for academics and practitioners, partly driven by the desire to identify which factors determine business performance in small and medium-sized businesses (SMEs) that are rapidly growing in developing countries [2].

As part of SMEs, start-up businesses have increased their awareness about the importance of business management; it focuses on managing their quality of service, product, production, and information. The development of quality in start-up businesses has so far focused on three things, namely quality planning, quality control, and quality improvement [3]. These three things are good enough but have not been integrated in a concept of a comprehensive quality of residence that will bring startups to develop towards the industry. The development of quality principles has been stated in the certification of *Sistem Manajemen Mutu* (Quality Management System) of the Indonesian National Standard Series SNI-19-9000-2001, which focuses on quality management. This is seen as one of the chosen company's strategy to address consumer demands for critical quality.

Several strategies have been confirmed to have an impact on business performance. Specifically, some innovative practices and strategies, such as total quality management (TQM), which focus on integrated quality [4]. TQM is a strategy that is based on a resource-based view (RBV), and it is divided into two sides, namely "Soft" TQM and "Hard" TQM [5]. The "Soft" side is associated with management concepts and principles, such as leadership, member empowerment, and culture in the business. While the "Hard" side refers to tools and techniques to improve business quality [6]. The "Soft" TQM elements consist of long-term business problems, which are emphasized and are useful to help a startup to achieve the business performance expected by stakeholders. Despite much research in the "Soft" TQM literature [5-11], they recommend that an improvement in an initial business, in this case a start-up business, is not a one-time start, but rather an ongoing and never-ending process.

Startups play the role of economic growth in the digital era in some developing countries and become an agent of distortion for business that are already running, so quality is seen as the best currency to make them bigger and sustainable. Several researchers have proven [12-14] that TQM has a positive impact on achieving business performance in developing countries. Previous studies have found contradictory or inconclusive findings. However, there are still limited research that proves the impact of "Soft" TQM on SMEs and startups in Indonesia. Therefore, this research will find the gaps that previously have not been examined in the context of startups in developing countries.

This study test the impact of "Soft" TQM elements on business performance of start-up businesses. The model's reliability and validity are examined through Confirmatory Factor Analysis (CFA) while the relationship between the "Soft" TQM elements is examined through Partial Least Square (PLS). We organized the paper into 4 parts. The first section will present a literature review about "Soft" TQM. The second section will explain the research methodology used at startups in Surabaya. The third section presents the research analysis and results. Finally, the last section discusses the result of the study and the conclusion.

2. Literature Review

2.1. "Soft" TQM

The "Soft" TQM practice is a long term factor that is related to business management aspects and must be considered and targeted within the start-up business' TQM strategy and followed with subsequent implementation plan [15]. Soft TQM practices generally deal with empowering human resources in business and concentrating on employee development, teamwork, supplier relations, and management creating value for consumers and achieving customer satisfaction [16]. Compare to Hard TQM; Soft TQM is more difficult to measure because the results, measurement, and assessments are harder to be seen; hence, it becomes a major challenge for start-up business owners. Some researchers [16-19] assert that an organization that has implemented the "Soft" TQM practices has shown a better performance than the competitors and gain competitive advantages. The elements in "Soft" TQM that have been detected in recent studies are as follow (Table 1): Process approach, Supplier relationship, Factual approach, Team involvement, Customer Focus, and Continuous Improvement.

"*Soft*" TQM	Articles
Process Approach	[4-6, 8, 10, 11, 18]
Supplier Relationship	[4, 6, 10, 11, 16, 19-21]
Factual Approach	[4, 5, 8, 10, 11, 16, 17]
Team Involvement	[14, 21-26]
Customer Focus	[2, 6, 14, 25, 27-29]
Continuous Improvement	[4, 8, 17, 30-33]

Table 1. "Soft" TQM Literature

2.2. Business Performance

Some researchers have previously shown different findings in measuring business performance. Due to this reason, there is no universally accepted definition of this concept [9, 34-36]. In this study, business performance is conceptualized using three variables: customer results, process results, and employee results. All three business performance variables are measured using 15 performance indicators. Some of these performance indicators have been previously used in research studies by several researchers [19, 37-39]. Thus, the performance indicators used in this study are the main performance indicators of startups on a scale of SMEs.

Business Performance	Articles
Customer Results	[3, 16, 40-42]
Process Results	[3, 16, 43-45]
Employee Results	[7, 19, 25, 46]

Table 2. Business Performance Literature

2.3. "Soft" TQM and Business Performance

Several researchers have also reviewed the relationship between TQM and Business Performance. Some findings conclude that aspects of TQM have a positive impact on business performance in developing countries [19, 47, 48]. In addition, after further review, the "Soft" TQM aspects show a long-term impact, which is different from "hard" TQM aspects which tend to show a short-term impact on business performance [6, 19].

In the scale of start-up businesses, business performance is still measured using existing measurements, such as SMEs. Studies on SMEs' business performance and aspects of TQM have conducted to see what trends are causing the business to achieve and sustain its performance [17, 40]. Corporate practitioners and academics believed that aspects of TQM are responsible to develop startups business performance.

Several researchers, such as Prajogo and Sohal [14], have sought to explore the relationship between quality and performance various business sectors. According to this research, effective quality implementation leads to improvement in business performance. Prajogo and Sohal [49] studies the impact of TQM and business strategies related to the performance of Australian SMEs using the Australian Quality Awards framework. The observation shows a positive correlation between TQM practices and SMEs business performances. Yee, Yeung [50] also found that the philosophy and TQM integration positively influenced cost reduction and business performance of small and medium-size companies in Taiwan. Besides, other empirical studies have measured business performance using the TQM criteria [5, 51].

It can be seen that countless studies explore the relationship between aspects of TQM and business performance. The interesting thing is that start-up businesses in a developing country, like Surabaya, Indonesia, play an important role in Surabaya's economic growth as it increases the number of employment and economic growth. Therefore, this research is relevant and will help startups to improve their business performance by improving their quality and hoped to help them in achieving global competitiveness.

3. Hypothesis Development

The purpose of this study is to examine the impact of "Soft" TQM elements on business performance, especially of startups in Surabaya. Thus, the hypotheses are formulated and tested as follow:

The process approach is intended that the desired results are achieved more efficiently when resources and activities are managed as a process. This shows that the start-up management should design a process for implementing quality to be aligned with related activities, steps of control and other resources with the process. For example, using software to monitor the production process in the company [14, 29]. This phase must also be aligned with establishing a positive correlation with the supplier. Therefore, the above hypothesis is proposed.

H1. The process approach has a positive impact on business performance

A mutually beneficial supplier relationship and a mutually beneficial relationship will increase their (the business and the supplier) ability to create value. This implies that there must be an effort to work with suppliers to improve cost, quality, delivery and design. For example, regular meetings with suppliers to discuss improvements on the design of the package, adjusting shipping schedules to adding features to the product [16].

H2. Relationship between supplier(s) has a positive impact on business performance

A factual approach to decision making means that the owner of a startup must make a decision based on adequate data analysis and information, and not just from a business intuition. This implies that the decision-makers within the company is coming up with decisions about quality; they must ensure the accuracy and reliability of data and must always make decisions based on logical analysis. For example, choosing supplier selection based on recognized quality certifications [4].

H3. The factual approach has a positive impact on business performance

Involvement of team members means that employees at all levels must be recognized as the essence of the organization and strategies must be made to ensure their full involvement so that the organization can get the maximum benefit from their abilities. For example, employees are involved in designing quality-related training programs or designing quality achievement strategic plans [31].

H4. Team involvement has a positive impact on business performance

Customer focus means that companies must understand and determine customer needs by meeting their requirements and trying to exceed their expectations. This shows that companies must regularly assess customer needs through group discussion forums (FGD), market surveys, private meetings, etc. [19].

H5. Customer focus has a positive impact on business performance

Continuous improvement means that all members of the organization in the company must use periodic assessments of potential excellence criteria. This implies that continuous improvement of products, processes, and systems must be a permanent goal for every organization, including improving product quality based on consumer response. Continuous improvement helps in reducing process variability so that it continues to improve product output performance [5].

H6. Continuous improvement has a positive impact on business performance

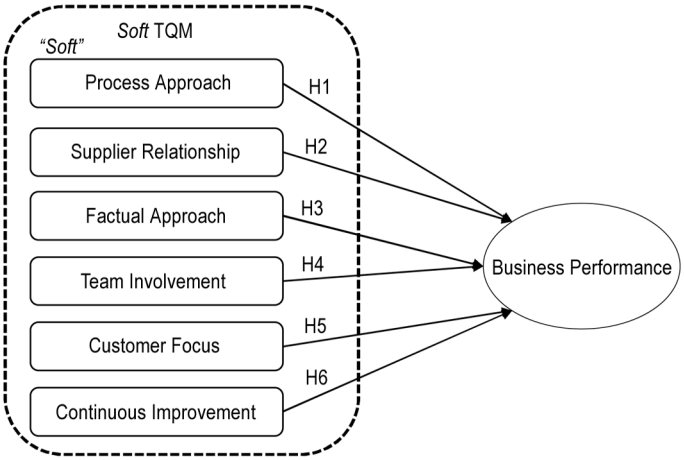


Figure 1. Relationship Model between "Soft" TQM and Business Performance

4. Research Method

4.1. Measurement, Population, and Samples

This sample of this study includes startup businesses in Surabaya, East Java. In detail, the sample group is divided into two types of businesses, namely Technology Start-ups and Non-Technology Start-ups. A total of 316 questionnaires were distributed digitally to the owner of the startups in Surabaya area. In a result, there are 171 questionnaires filled properly, so the response rate was 54%.

The questionnaire was initially tested through a preliminary study conducted on a sample of 30 startup business owners in Surabaya. This questionnaire was also shown to experts in the field of Business Incubators at the university level to seek feedback on content, clarity and overall structure. Based on their suggestions and comments, the questionnaire was adjusted.

This research uses a Likert scale. Likert scale is used to measure a person's behavior, opinions, perceptions about a phenomenon, where the measurement instrument used has a scale of (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Very Agree.

Before multivariate analysis is carried out, assumptions are examined about sample size, variable scale, multicollinearity, and data distribution.

5. Result and Discussion

5.1. Descriptive Analysis and Correlation Analysis

The startups are participating in this study consist of 45 startups (26%) and 126 non-tech startups (74%), where most of them were registered in several University business incubators in Surabaya, and some has implemented business implementation for three years or less. The startups were chosen as samples because currently the growth of startups is quite rapid and is part of the employment provider and this is supported by the era of disturbances that form a general perspective that startups can become a wave of disruption for large companies that have existed before.

Variable	Mean	SD	n
Process Approach	3.679	0.808	171
Supplier Relationship	3.904	0.486	171
Factual Approach	3.464	0.707	171
Team Involvement	3.957	0.783	171
Customer Focus	3.521	0.749	171
Continuous Improvement	3.412	0.679	171
Business Performance	3.582	0.835	171

Table 3. Statistic Descriptive

5.2. Confirmatory Factor Analysis

The measured value for each question, obtained from the respondent, is the variable measured from the model. Table 4 describes the results of each criteria using PLS by involving the value of Loading Factors and Cronbach alpha. While the latent variables are tested for validity and reliability through CFA for each latent variable.

"*Soft*" TQM	Cronbach's α	Loading Factor
Element X1: Process Approach (P1-P4)	0.901	
1. Availability of a scheduled evaluation system		0.877
2. Check the delivery time at the supplier		0.898
3. Use qualification criteria to choose vendor(s)		0.903
4. Customer identification through scheduled customer discussions		0.947
Element X2: Supplier Relationship (P5-P8)	0.370	
1. Collaborate with suppliers to improve distribution		0.327
2. Regular meetings with suppliers		0.125
3. Increase benchmarks on a scheduled basis		0.120
4. Audits on suppliers		0.951
Element X3: Factual Approach (P9-P11)	0.911	
1. The quality of the majority of suppliers are certified		0.882
2. A plan to review the company's quality policy		0.931
3. Quality clauses are available for purchasing materials		0.414
Element X4: Tea Involvement (P12-P15)	0.769	
1. Employee involvement in quality training		0.922
2. Encourage the employees to work in teams		0.911
3. Recognition of employees for their contribution to the quality policy		0.751
4. Quality culture in the organization		0.919
Element X5: Customer Focus (P16-P18)	0.621	
1. Regular assessment on customer needs		0.454
2. Implementation of new procedures		0.705
3. Improvement in all functions		0.445
Element X6: Continuous Improvement (P19-P21)	0.927	
1. Efforts to get feedback from customers		0.929
2. There is an assessment on employee performance		0.795
3. Continuous process improvement		0.796
Business Performance Y1 (P22-P25)	0.794	
1. Customer Results		0.784
2. Process Results		0.846
3. Employee Results		0.849

Table 4. Results of Analysis and Confirmatory Factor Analysis

Based on Table 4, Supplier Relationship Variable has a value of less than 0.5, which is equal to 0.370; this means that the variable and the indicators cannot be maximized in measuring business performance. The factor loading value is evaluated to see the convergent validity of the variable. The results state that the supplier relationship variable cannot be used and in further testing. The results of the model testing get R-Square values that describe the good-of-fit model. The expected R-square value is greater than zero. Table 5 shows the value of Business

Latent Variable	Average Variance Extracted	Composite Reliability	R-Square
Process Approach	0.822	0.948	
Supplier Relationship	0.760	0.640	
Factual Approach	0.606	0.807	
Team Involvement	0.772	0.931	
Customer Focus	0.739	0.623	
Continuous Improvement	0.171	0.879	
Business Performance	0.684	0.866	0.517

Table 5. Reliability and Validity Model

Performance (Y1) is 0.517 means that this research model meets the requirements.

5.3. Hypothesis test

Based on the results of the interpretation of each coefficient with a sample of 171 respondents (t-table: 1.666), in Table 6 it stated: H1: The process approach has a significant effect on the positive direction on business performance seen from the t-statistic of 2.582. H2: Supplier relationships have a significant effect on business performance seen from the t-statistic value 3.917, although it cannot optimally measure business performance. H3: The factual approach does not significantly affect business performance, as seen from the t-statistic value of 0.073. H4: Team involvement has a significant influence on business performance seen from the t-statistic value of 2.543. H5: Customer focus does not have an influence on business performance with a value of 0.864. H6: Continuous improvement has an influence on business performance seen from the t-statistic value of 1.876.

Hypothesis	Description	P-Value	T-Statistic	Note
H1	Process Approach → Business Performance	0.215	2.582	Supported
H2	Supplier Relationship → Business Performance	0.331	3.917	Supported
H3	Factual Approach → Business Performance	0.009	0.073	Rejected
H4	Team Involvement → Business Performance	0.231	2.543	Supported
H5	Customer Focus → Business Performance	0.095	0.864	Rejected
H6	Continuous Improvement → Business Performance	0.222	1.876	Supported

Table 6. Hypothesis Test

6. Conclusion

In general, from the sample of start-up companies in this study, it can be concluded that they have a great desire to achieve quality, considering that most of the start-up businesses are on the non-technology line that is vulnerable to the final quality of the product. In addition, if we consider the desire of most start-up businesses to adopt the basic principles of "Soft" TQM into their quality system, this implies a concrete step for startups in optimizing elements that have a large influence on their business performance and bringing an advantage on business competition [52].

However, we wish to emphasize that the quality management efforts undertaken by each start-up businesses are not enough to satisfy the customers. To meet the customers, quality assurance must be ensured to occur outside the company, such as through distribution channels or promotional efforts [14]. In start-up companies, several different elements are different from other types of companies. They are referred to as a "disruption" for companies that have lasted long enough [53].

The factual approach in this study is considered not to affect the achievement of business performance. This is seen because startups are more concerned with prices that are quite cheap for each material used. This is motivated by the nature of the financial cycle they have. On the other hand, larger companies are highly considered the quality certificates in the procurement of materials. This is supported by differences in the phenomenon of large companies that are highly focused on fulfilling customer satisfaction. Unlike startup companies, they focus more on finding dynamic entrepreneurial solutions that can provide business opportunities for them [54]. Such as digital financial solutions, digital learning solutions, and process diversification solutions which will all make the presence of startups will disrupt a company that has been established.

References

[1] Teofilus, T., Sutrisno, T. F. C. W., & Gomuljo, A. (2019). The elements of packaging that form a brand personality: Study in Aroma Premium Sekoteng products. Mix: *Jurnal Ilmiah Manajemen*, 9(2): 382-393.

[2] Sutrisno, T. F. C. W. (2019). Relationship between total quality management element, operational performance and organizational performance in food production SMEs. *Jurnal Aplikasi Manajemen*, 17(2): 285-294.

[3] Rahab, R., Sulistyandari, S., & Sudjono, S. (2011). The development of innovation capability of small medium enterprises through knowledge sharing process: An empirical study of Indonesian creative industry. *International Journal of Business and Social Science*, 2(21): 112-123.

[4] Abdallah, A. (2013). The influence of “soft” and “hard” total quality management (TQM) practices on total productive maintenance (TPM) in Jordanian Manufacturing Companies. *International Journal of Business and Management*, 8(21): 1-13.

[5] Gadenne, D., & Sharma, B. (2009). An investigation of the hard and soft quality management factors of Australian SMEs and their association with firm performance. *International Journal of Quality & Reliability Management*, 26(9): 865-880.

[6] Fotopoulos, C. B., & Psomas, E. L. (2009). The impact of “soft” and “hard” TQM elements on quality management results. *International Journal of Quality & Reliability Management*, 26(2): 150-163.

[7] Abdullah, A. (2010). Measuring TQM implementation: A case study of Malaysian SMEs. *Measuring Business Excellence*, 14(3): 3-15.

[8] Albuhisi, A. M., & Abdallah, A. B. (2018). The impact of soft TQM on financial performance: The mediating roles of non-financial balanced scorecard perspectives. *International Journal of Quality & Reliability Management*, 35(7): 1360-1379.

[9] Karimi, Y., & Kadir, S. L. S. A. (2012). The impact of organisational culture on the implementation of TQM: Empirical study in the Iranian Oil Company. *American Journal of Industrial and Business Management*, 2(4): 205-216.

[10] Lewis, W. G., Pun, K. F., & Lalla, T. R. M. (2006). Empirical investigation of the hard and Soft criteria of TQM in ISO 9001 certified small and medium-sized enterprises. *International Journal of Quality & Reliability Management*, 23(8): 964-985.

[11] Yunis, M., Jung, J., & Chen, S. (2013). TQM, strategy, and performance: A firm-level analysis. *International Journal of Quality & Reliability Management*, 30(6): 690-714.

[12] Abusa, F. M., & Gibson, P. (2013). TQM implementation in developing countries: A case study of the Libyan industrial sector. *Benchmarking: An International Journal*, 20(5): 693-711.

[13] Jancikova, A., & Brychta, K. (2009). TQM and organizational culture as significant factors in ensuring competitive advantage: A theoretical perspective. *Economics and Sociology*, 2(1): 80-95.

[14] Prajogo, D. I., & Sohal, A. S. (2004). The multidimensionality of TQM practices in determining quality and innovation performance. *Technovation*, 24(6): 443-453.

[15] Temtime, Z. (2003). The moderating impacts of business planning and firm size on total quality management practices. *The TQM Magazine*, 15(1): 52-60.

[16] Sinha, N., Garg, A. K., & HDhall, N. (2016). Effect of TQM principles on performance of Indian SMEs: The case of automotive supply chain. *The TQM Journal*, 28(3): 338-359.

[17] Lewis, W., Pun, K., & Lalla, T. (2006). Exploring soft versus hard factors for TQM implementation in small and medium-sized enterprises. *International Journal of Productivity and Performance Management*, 55(7): 539-554.

[18] Keng Boon, O., Arumugam, V., & Seng Hwa, T. (2005). Does Soft TQM predict employees’ attitudes? *The TQM Magazine*, 17(3): 279-289.

[19] Psomas, E., Vouzas, F., & Kafetzopoulos, D. (2014). Quality management benefits through the “soft” and “hard” aspect of TQM in food companies. *The TQM Journal*, 26(5): 431-444.

[20] Calvo-Mora, A., Picón, A., Ruiz, C., & Cauzo, L. (2014). The relationships between soft-hard TQM factors and key business

results. *International Journal of Operations and Production Management*, 34(1): 115-143.
[21] Dubey, R. (2015). An insight on Soft TQM practices and their impact on cement manufacturing firm's performance: Does size of the cement manufacturing firm matter? *Business Process Management Journal*, 21(1): 2-24.
[22] Al-Dhaafri, H., & Al-Swidi, A. (2016). The impact of total quality management and entrepreneurial orientation on organizational performance. *International Journal of Quality & Reliability Management*, 33(5): 97-614.
[23] Antunes, M. G., Quiros, J. T., & Justini, M. d. R. F. (2017). The relationship between innovation and total quality management and the innovation effects on organizational performance. *International Journal of Quality & Reliability Management*, 34(9): 1474-1492.
[24] Imran, M., Azelin, A., Norasyikin, S., Shabbir, M. S., Salman, R., & Jian, Z. (2018). The mediating role of total quality management between entrepreneurial orientation and SMEs export performance. *Management Science Letters*, 8(6): 519-532.
[25] Talib, F., & Rahman, Z. (2015). Identification and prioritization of barriers to total quality management implementation in service industry : An analytic hierarchy process approach. *The TQM Journal*, 27(5): 591-615.
[26] Tannock, J., Krsachol, L., & Ruangpermpool, S. (2002). The development of total quality management in Thai manufacturing SMEs: A case study approach. *International Journal of Quality & Reliability Management*, 19(4): 380-395.
[27] Mandal, P., Love, P. E. D., Sohal, A. S., & Bhadury, B. (2000). The propagation of quality management concepts in the Indian manufacturing industry: Some empirical observations. *The TQM Magazine*, 12(3): 205-213.
[28] Siddiqui, J., & Rahman, Z. (2007). TQM principles' application on information systems for empirical goals: A study of Indian organizations. *The TQM Journal*, 19(1): 76-87.
[29] Prajogo, D. I. (2005). The comparative analysis of TQM practices and quality performance between manufacturing and service firms. *International Journal of Service Industry Management*, 16(3): 217-228.
[30] Al-Dhaafri, H. S., & Yusoff, R. Z. B. (2013). The effect of total quality management , enterprise resource planning and the entrepreneurial orientation on the organizational performance: The mediating role of the organizational excellence – A proposed research framework. *International Journal of Business Administration*, 4(1): 66-86.
[31] Fotopoulos, C. B., & Psomas, E. L. (2010). The structural relationships between TQM factors and organizational performance. *The TQM Journal*, 22(5): 539-552.
[32] Lakhe, R. R., & Mohanty, R. P. (1994). Total Quality Management 9 Total Quality Management Concepts, Evolution and Acceptability in Developing Economies. *International Journal of Quality & Reliability Management*, 11(9): 9-33.
[33] Sun, H. (2000). Total quality management, ISO 9000 certification and performance improvement. *International Journal of Quality & Reliability Management*, 17(2): 168-179.
[34] Ahmed, M., & Shafiq, S. (2014). The impact of organizational culture on organizational performance: A case study of Telecom Sector. *Global Journal of Management and Business Research: Administration and Management*, 14(3): 1-11.
[35] Aramburu, N., Saenz, J., & Blanco, C. E. (2015). Structural capital, innovation capability, and company performance in technology-based colombian firms. *Cuadernos de Gestión*, 15(1): 39-60.
[36] Demirbag, M., Tatoglu, E., Tekinkus, M., & Zaim, S. (2006). An analysis of the relationship between TQM implementation and organizational performance: Evidence from Turkish SMEs. *Journal of Manufacturing Technology Management*, 17(6): 829-847.
[37] Arumugam, V., Chang, H. W., Ooi, K. B., & Teh, P.-L. (2009). Self-assessment of TQM practices: A case analysis. *The TQM Journal*, 21(1): 46-58.
[38] Bleeker, I. (2011). *The Influence of Entrepreneurial Orientation on The Innovation Process: An Empirical Research on Manufacturing SMEs*. University of Twente, Twente.
[39] Valmohammadi, C. (2011). The impact of TQM implementation on the organizational performance of Iranian manufacturing SMEs. *The TQM Journal*, 23(5): 496-509.
[40] Carlos Pinho, J. (2008). TQM and performance in small medium enterprises: The mediating effect of customer orientation and innovation. *International Journal of Quality & Reliability Management*, 25(3): 256-275.
[41] Alamri, A. M., Alharthi, A. M., Alharthi, D. K., Alhabashi, W. S., & Hasan, S. H. (2014). Organization Performance Improvement using TQM. *International Journal of Computer Applications*, 108(9): 29-33.
[42] Rezaei, J., & Ortt, R. (2018). Entrepreneurial orientation and firm performance: the mediating role of functional performances. *Management Research Review*, 41(7): 878-900.
[43] Demirbag, M., Lenny Koh, S. C., Tatoglu, E., & Zaim, S. (2006). TQM and market orientation's impact on SMEs' performance. *Industrial Management & Data Systems*, 106(8): 1206-1228.
[44] Psomas, E. L., & Jaca, C. (2016). The impact of total quality management on service company performance: evidence from Spain. *International Journal of Quality & Reliability Management*, 33(3): 380-398.
[45] Potocki, K., & Brocato, R. C. (1995). system of management for organizational improvement. *John Hopkins Apl Technical Digest*, 16(4): 402-412.
[46] Samat, N., Ramayah, T., & Mat Saad, N. (2006). TQM practices, service quality, and market orientation: Some empirical evidence from a developing country. *Management Research News*, 29(11): 713-728.
[47] Habibah Abdul Talib, H., Anuar Mohd Ali, K., & Idris, F. (2014). Critical success factors of quality management practices among SMEs in the food processing industry in Malaysia. *Journal of Small Business and Enterprise Development*, 21(1): 152-176.
[48] Temtime, Z. T., & Solomon, G. H. (2002). Total quality management and the planning behavior of SMEs in developing economies. *The TQM Magazine*, 14(3): 181-191.
[49] Prajogo, D. I., & Sohal, A. S. (2001). TQM and innovation: A literature review and research framework. *Technovation*, 21(9): 539-558.
[50] Yee, E. W. Y., Yeung, A. C. I., & Cheng, T. C. E. (2008). The impact of employee satisfaction on quality and profitability in high-contact service industry. *Journal of Operations Management*, 26(5): 651-668.
[51] Santos-Vijande, M. L., & Alvarez-Gonzalez, L. I. (2007). TQM and firms performance: An EFQM excellence model research based survey. *Journal of Business Science and Applied Management*, 2(2): 21-41.
[52] Amoako-Gyampah, K., & Acquaah, M. (2008). Manufacturing strategy, competitive strategy and firm performance: An empirical study in a developing economy environment. *International Journal of Production Economics*, 111(2): 575-592.
[53] Irani, Z., Beskese, A., & Love, P. E. D. (2004). Total quality management and corporate culture: Constructs of organisational excellence. *Technovation*, 24(8): 643-650.
[54] Kam Sing Wong, S. (2012). The influences of entrepreneurial orientation on product advantage and new product success. *Journal of Chinese Entrepreneurship*, 4(3): 243-262.

Specifics of Forming the Russian Middle Class According to the Factorial Model of Managing Living Standards

Svetlana Germanovna ZAKHAROVA[1*], Sergey Alexandrovich BORISOV[2], Ekaterina Nikolayevna LAPSHINA[3], Albina Mikhailovna OZINA[4], Anatoliy Nikolayevich CHERNYSHOV[5]

[1]Ph.D., Associate Professor of Management and Public administration of Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia
[2]Ph.D., Associate Professor of Management and Public administration of Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia
[3]Assistant of Management and Public administration of Lobachevsky State University of Nizhny Novgorod, Nizhny Novgorod, Russia
[4]Doctor of Economics, Professor, Chair of Economic Theory of Russian Presidential Academy of National Economy and Public Administration under the President of the Russian Federation, Nizhny Novgorod, Russia
[5]Ph.D., Associate Professor, Chair of Economic Theory of Russian Presidential Academy of National Economy and Public Administration under the President of the Russian Federation, Nizhny Novgorod, Russia
[*]Corresponding author; E-mail: svetlana-nngu@mail.ru

Abstract

The authors of the article consider the burning issues associated with the formation of the middle class in Russia within the factorial model of managing living standards. The authors study the key factors that influence the formation of the Russian middle class and the conditions under which the number of people belonging to this class will increase. A comprehensive assessment of the conditions necessary to form the middle class in Russia is conducted using methods of socio-economic analysis and sociological research evaluating the quality of life. A full-fledged sociological survey based on the research techniques developed by the authors and processed by the methods of socio-economic statistics has revealed factors that have an indirect negative impact on the formation of the middle class in Russia. The authors have established the most significant factors affecting living standards, thereby determining the share of the middle class. These include low average wages in provincial regions primarily associated with an inadequate level of contextual intelligence in an ever-changing institutional environment and internal and external conditions, as well as a low level of socio-economic development, infrastructure-related problems and the insufficient innovative potential of rural territories. The authors have determined that the conditions necessary for forming the middle class can be assessed only from the perspective of an integrated factorial approach. The study has shown that it is necessary to create conditions that fully satisfy A. Maslow's hierarchy of needs in order to form and expand the middle class in the Russian Federation. In this regard, the factorial model of managing living standards enables to develop methods and technologies for controlling a set of measures aimed at increasing the share of the Russian middle class.

Keywords: *living standards; factorial model of managing living standards; middle class; personal income, quality of life, income inequality, statistical methods of analysis.*

1. Introduction

The Concept for the development of the Russian Federation indicates that the quality of life is the ultimate goal of management. Administrative reforms related to institutional transformations, as well as the national goals and strategic objectives of the country's development for the period until 2024 established by the Decree of the President of the Russian Federation, aim at creating an appropriate and efficient system of state and municipal government that can ensure a significant increase in the quality of life in the nation. These strategic guidelines with a clear socio-economic focus will be achieved due to breakthrough actions in the scientific and technological development of the country (Zakharova, 2016). However, scientists from different spheres have stated that the relationship between a high level of socio-economic indicators and the quality of life is not direct. In addition, the concept "living standards" is rather complex and its comprehensive assessment often involves an assessment of the hierarchical system of factors, criteria and indicators that characterize the economic development of society, the level of material, medical-ecological and cultural-spiritual well-being of the population (Zakharova, 2017b).

Using economic and mathematical methods, scholars study the issue of transforming economic recovery into an appropriate process in order to improve the quality of life (Golubeva, 2015). However, some scientists believe that in a modern and ever-changing world an adequate assessment can be given only through determining the degree to which total characteristics of life activities correspond to certain requirements of the population (Sadykov, 2014). According to the Concept for the socio-economic development of Russia until 2024, one of the most difficult tasks is to understand the depth of these transformations and governing inputs from the position of state

and municipal management systems (Somenkova & Zakharova, 2019). Factors affecting the quality of life can be regarded as conditions for the formation of the middle class in Russia (Zakharova & Borisov, 2018).

The concept of middle class is ambiguous and has many approaches and characteristics. Most scholars claim that the social class of people with stable incomes sufficient to satisfy a wide range of material and social needs can be assigned to the middle class (Lavrinenko, 2012). One cannot deny that governing inputs from state and municipal authorities create conditions for the economic, medico-ecological and cultural-spiritual development of a particular territory. At the same time, it is very difficult to evaluate the governing input associated with the development of infrastructure, institutional environment and investment climate using direct quantitative indicators (Somenkova & Zakharova, 2019). In addition, scientists believe that the level of innovative development of enterprises directly affects the formation of the middle class. When studying this issue, we revealed that regions with a developed industrial sector had the highest living standards (Lapshina et al., 2018).

2. Methods

When comparing different approaches to the analysis of factors improving living standards and, consequently, contributing to the formation of the middle class in Russia, it is worth mentioning the model of factor incomes developed by S.G. Zakharova (2017a) (Figure 1). This model explains many issues related to the period of deep institutional transformations in Russia, provides for the cyclical nature of socio-economic development and the dynamics of interconnected management systems, as well as determines the conditions necessary for the formation of the middle class through a sociological assessment of its main components.

This factorial model of managing the quality of life demonstrates three input factors whose impact cannot be assessed by direct quantitative indicators but they are able to significantly change the quality of life of the population.

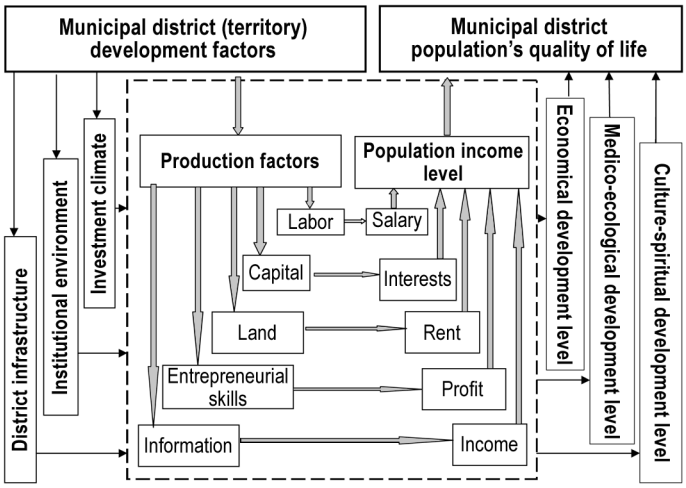


Figure 1. The factorial model of managing quality of life (Zakharova, 2016, 2017a)

To develop this factorial model of managing the quality of life, we conducted a comprehensive study of living standards in rural and municipal districts of the Nizhny Novgorod Region in 2010-2014. More than 1,500 persons with a Bachelor's or higher degree participated in the survey. The respondents were asked to assess components of their quality of life, including general economic development, income, spiritual well-being and medico-ecological welfare on a scale from 1 to 10. The respondents indicated their satisfaction in each life activity as the degree of compliance of their requirements for all inherent characteristics with the above-mentioned components. In the course of the survey, the respondents were suggested to make a prediction for 2015 and 2016. Some of these study results were presented in our previous works (Lavrinenko, 2012), while the results of a complete analysis of sociological interviews are given in Table 1.

The factorial model of managing the quality of life makes it clear that the Russian middle class which has recently changed its institutional structure needs certain prerequisites for its full formation (Zakharova & Borisov, 2018). However, the uneven distribution of property along production factors deprives average Russians who are educated and well qualified of the opportunity to change their social status. A high level of income which allows realizing socially significant abilities and interests of an individual can be obtained only if there are developed public institutions that are formed under the influence of the institutional system (Ozina & Chernyshov, 2013).

There are still scientific and public discussions related to population distribution into different classes and the formation of the Russian middle class. We pay special attention to the quality of life of highly educated people who form the middle class corresponding to the characteristics common to the middle class in foreign countries. The study has shown that the Russian population with high social characteristics is more likely to be included in low-income groups according to the Western financial standards.

This fact is of particular social importance for the sustainable development of Russia since the middle class is the basis of stability characterized by higher social resilience, the bearer of general and universal cultural principles, the guardian of public relations, the carrier of the prevailing ideology and the whole system of values representing the economic and socio-political median of society (Shapovalov, 2017). The strategic focus of the middle class on maintaining the prevailing socio-economic relations serves as the basis of social and political balance.

It is challenging to identify the share of the Russian middle class due to the lack of a unified system for determining the middle class in the country. There are different approaches to the criteria for classifying citizens as members of the middle class; therefore, the results of the studies conducted by scientists and practitioners seriously vary.

We can distinguish between the following justified approaches to determining the middle class (Giddens, 1987).

The objective approach is based on assessing the level of material well-being. Objective characteristics of the material well-being of a social subject with relatively high living standards and consumption level help to identify people belonging to the middle class. These indicators include income per capita, expensive property (for example, expensive household appliances, luxury cars), possibility of using educational and medical services on a paid basis, ability to travel and rest in comfort, etc.

The subjective approach suggests that people classify themselves as the middle class. The subjective approach characterizes the internal attitude of people to life security, opportunities for socio-economic consumption and self-realization, includes a set of socio-psychological characteristics of individuals and is based on the self-identification of people with representatives of the middle class.

The combinatorial approach combines objective and subjective approaches. The combinatorial approach for establishing a person's status as a member of the middle class uses such parameters as professional characteristics, education, property and income, including self-realization and self-identification, thereby including the advantages of both objective and subjective approaches.

3. Results

In the course of the study, we analyzed the methods and results of determining the share of the middle class in Russia compared to other countries, which is of scientific interest.

The American scientists William Thompson and Joseph Hickey (2005) developed a specific theory of determining the

middle class and divided the whole society into three main categories, according to their level of education, qualification and income. Based on this theory, the key role in classifying a person as a member of the middle class is played by the following components:

- Education, which determines the high social status and the appropriate level of payment helping people to successfully rise on the social scale;
- Level of qualification, which provides decent work and salary;
- Total income, which comprises not only wages but also additional income from other factors of production, including capital, natural resources, the use of information channels, income from entrepreneurial activity.

According to Thompson and Hickey (2005), the upper-income class makes up about 15% of the US population, including people with a college degree and occupying the positions of specialists and senior managers with an income of over $100,000 per year. The middle class amounts to 64% of the US population, including people with a college degree, having secondary vocational training and occupying the positions of specialists and mid-level managers, as well as highly skilled workers capable of independent work, with an income between $35,000 and $75,000 per year.

We should note that only a small share of the Russian population with relatively high living standards and a high level of consumption can be regarded as the middle class in conformity with the classification adopted by developed nations. According to the research results, only 13 million people (9% of the total Russian population) are included into the middle class since they own apartments, houses, cars, have considerable savings and can comfortably travel and receive medical treatment (even abroad).

The World Bank defines the middle class in Russia as a part of the population whose consumption level is one and a half times higher than the national poverty threshold (people whose income is below the minimum living wage) and states that its number in Russia has increased significantly. The World Bank experts announced that the share of the middle class in the total population increased from 27% to 60% and the poverty rate decreased from 35% to 10% due to the growth of salaries and retirement pensions in the Russian Federation from 2001 to 2014 (Global Wealth Report, 2015). However, these positive trends are mostly associated with the underestimation of reference points and limited opportunities for studying very high net worth individuals. The study does not consider the significant difference in the incomes of lower- and upper-income classes and does not explain the growing inequality of income corresponding to production factors.

The survey of citizens of the Russian Federation conducted by the All-Russian Public Opinion Research Center demonstrated that over 80% of Russians think poor people are those who barely have enough money for food or clothing. In March 2017, this group amounted to 35% and 6% of the respondents noted that they found it hard to buy products (The official website of the All-Russian Public Opinion Research Center). The growth of salaries and social benefits is the main factor conditioning the increase in middle-class incomes in Russia. In 2001, they accounted for 73% of total revenues. In 2010, it was 64% with a significant increase in the share of retirement pensions. In 2018, their number reached 64%.

According to the Institute of Contemporary Development, the classical middle class of developed economies should include countries where the total monthly income for each family member exceeds 2-2.5 thousand dollars, the total area of housing for each family member is at least 40 m^2, each family has two or three cars, which characterizes the level of their independence, comfort, freedom and mobility. In Russia, only 7% of citizens can be attributed to the middle class since they correspond to these high requirements (The official website of the Institute of contemporary development).

The Swiss bank Credit Suisse in the Global Wealth Report 2015 stated that no more than 5 million people could be attributed to the middle class in Russia, i.e. only 4.1% of the adult population with an income of $18,000 per year. At the same time, scholars note that the situation took a turn for the worse in 2016. In this period, the well-being of Russians decreased from $12,000 to $10,300 per person and the population became more differentiated which increased the income gap between the richest and poorest Russians. The survey notes that 10% of the wealthiest Russian families owned 89% of all assets in 2016, while the middle class in Russia decreased to 5.6 million people if compared to 2000 (Global Wealth Report, 2015).

We should also pay attention to the study conducted by the Center for Strategic Studies of Rosgosstrakh and based on the subjective approach (The Center for Strategic Studies of Rosgosstrakh. The official website). In the course of this study, people were asked to evaluate their income level. In 2015, 13% of the Russian population identified themselves as the middle class, while the size of this group amounted to 5% of the total population in 2003. The studies conducted by the Center for Strategic Studies demonstrate that the percentage of Russian citizens able to buy a new car had decreased to 12% by August 2016. Figure 2 compares the results of defining the share of the middle class in Russia in terms of income according to the results obtained by the Center for Strategic Studies of Rosgosstrakh (the dark grey columns) (The Center for Strategic Studies of Rosgosstrakh. The official website) and the Institute for Contemporary Development (the light gray columns) (The official website of the Institute of contemporary development).

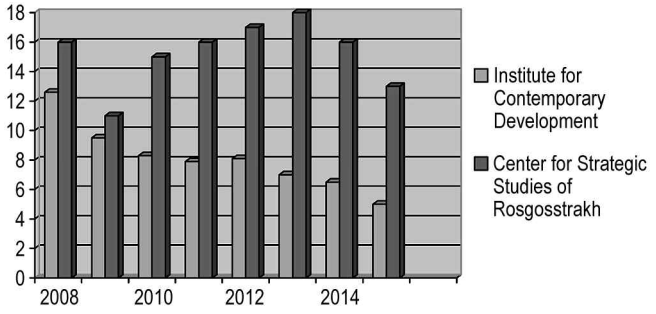


Figure 2. Comparing indicators of the middle class in Russia in terms of income according to the results obtained by the Center for Strategic Studies of Rosgosstrakh (The Center for Strategic Studies of Rosgosstrakh. The official website) and the Institute for Contemporary Development (The official website of the Institute of contemporary development)

According to the Center for Strategic Studies, Figure 2 demonstrates that the percentage ratio of the middle class is significantly different from the study results provided by the Institute for Contemporary Development.

While analyzing the purple line, we can see how sensitive the Russian middle class is to any economic change. Such factors as economic crises, exchange rate fluctuations and other changes affect the development of the country and its territories, as well as its living standards (Golubeva, 2015).

V.V. Kolbanovskii's scientific works are of particular interest since the scientist tries to answer the question of whether the middle class is a real-life phenomenon or exists only on paper (Kolbanovskii, 2013). A special focus should be laid on V.N. Bobkov's work dedicated to social structures, the middle class and employees (Bobkov, 2014). At the same time, the work of A.V. Tsimbalist determines the criteria for the formation of the middle class (Tsimbalist, 2014).

According to representatives the Financial University under the government of the Russian Federation, the middle class includes people with higher education, an average salary of 50,000 rubles a month (on average in the country), can buy a car and an apartment on credit, relax abroad, buy large

appliances with their savings. Figure 3 demonstrates that the percentage of the middle class, according to the Financial University under the government of the Russian Federation, it declined until 2015 from 17% to 10%, but since 2016 there has been a positive trend in the form of growth of this indicator to 15% in 2018.

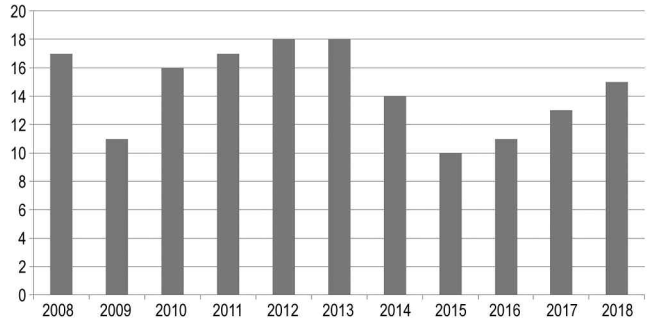


Figure 3. Change in the share of the middle class from 2008 to 2018 according to the Financial University under the government of the Russian Federation
(A study on the assessment of poverty and the size of the middle class in Russia. Available at: http://www.fa.ru/org/div/cos/press/Documents/61_Middle_Class_Poverty_1H_2018.pdf)

The analysis of these studies has shown that scientific opinions in the field of assessing the share of the middle class do not coincide due to the lack of generally accepted calculation methods. A detailed examination of factors and trends suggests that the percentage ratio of the middle class in relation to other groups of the population is declining. We believe that the main reason for this decline is a significant gap in the income of the population which is associated with the focus of property on production factors in the hands of a small part of the population. This situation is thoroughly explained by the factorial model of managing the quality of life (Zakharova, 2016).

Based on the special factorial model of managing the quality of life in the period of 2015-2016, we conducted a sociological survey among residents of the Nizhny Novgorod Region. The respondents were asked to assess different components of quality of life in accordance with their significance. The survey involved more than 1,300 respondents of various age groups living in the Nizhny Novgorod Region. The sociological assessment of the living standards typical of such people with higher and incomplete higher education in 2016 can dwell on the self-identification of people with the middle class.

The data obtained during the above-mentioned sociological survey of the population are summarized in Table 1.

Indicators characterizing the quality of life	Quality of life estimated on a 1 to 10 scale				
	2010	2012	2014	2016	2018
Level of general economic development	6.6	6.02	5.76	6.78	6.72
Level of material well-being among residents	6.36	5.98	5.86	6.41	6.49
Level of medico-ecological services	5.98	5.94	5.90	5.67	5.59
Level of cultural and spiritual development	6.38	5.74	5.72	7.04	7.11
Average score	6.33	5.92	5.81	6.48	6.54

Table 1. Results of the sociological survey of the population conducted between 2010 and 2018 and aimed at assessing the components of quality of life

Based on the developed methods and the studies previously published in (Zakharova, 2016, 2017a, 2017b; Zakharova & Borisov, 2018; Somenkova & Zakharova, 2019), we obtained the following results (Figure 4). The quality of life was assessed on a 1 to 10 scale (the step value is one point). The values range from 1 point (very bad) to 10 points (very good), while the parameter corresponding to the middle class started from 5 points.

The sociological survey of Russians with a college degree proved that the living standards of people who consider themselves members of the middle class are generally not high and some parameters (the red lines on the graph) are even below the average threshold of social status. We believe the low quality of life common to the middle class can be regarded as one of the most evident signs of the recession in the Russian economy. To address this issue, authorities should pay more attention to conditions necessary for the formation of the middle class in Russia which will serve as the pillar of the current state system, the foundation of a stable and developed economy and a guarantee of the future development (Zakharova & Maltsev, 2016). Many Russian scholars note that the low-level self-identification and self-realization of Russians belonging to the middle class calls for the revision of methods and technologies used for state management (Chernyshov & Chernyshova, 2011). At the same time, an expert assessment of the factors determining the quality of life enables to choose the direction of such changes (Slepukhin & Chaplygin, 2011). Using petal charts for factors grouped around four subjects of socio-economic interaction (population, business, state and municipal authorities), Figure 5 presents the following study results.

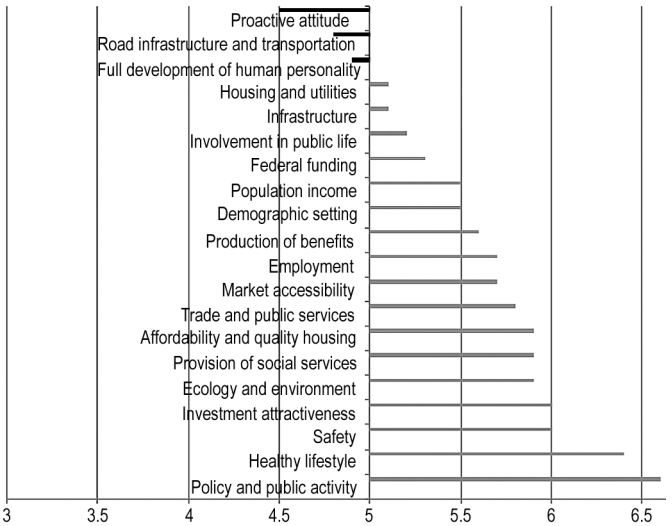


Figure 4. Results of the respondents' self-identification with the middle class

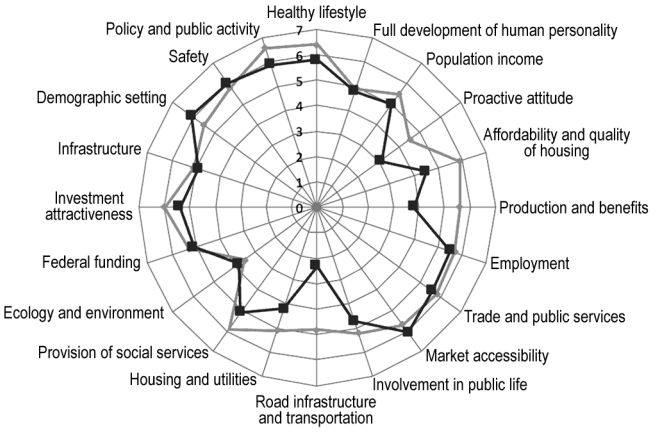


Figure 5. Assessment of living standards in the Nizhny Novgorod Region (according to the factorial approach) in 2014 (black) and 2018 (gray)

Most respondents evaluated their level of income as average, which corresponds to the concept of the middle class. The most negative component of quality of life on the part of the population itself was a passive life position, low interest in elections and political parties, and the protection of one's rights. In terms of business, the greatest positive impact is exerted by the development of trade and consumer services. Traditionally, road infrastructure and transportation are the most troubling

component in the field of services provided by executive authorities; its score amounted to 4.8 points (below the average) in 2018. Nevertheless, we should note that the authorities exert all powers to improve roads and transportation facilities, i.e. they repair and build new roads, backup bridges, repair and purchase new buses and other means of urban and suburban transport. Recently, there has been a trend for improving this indicator and the whole situation is changing for the better.

The analysis of the above-mentioned factors has shown that this region of the Russian Federation has a high level of investment attractiveness (according to the respondents, this indicator is above 6 points) but the territory needs to improve its innovative infrastructure to attract investors. It is necessary to develop efficient business plans in order to attract additional investments, which embraces representatives of public non-profit organizations and the scientific community and involves the development of business incubators, scientific and technological centers, etc. To increase the investment attractiveness of the region, the authorities should develop partnership relations among government, business and active citizens within the framework of public non-profit organizations. The experience of Russian and foreign scholars shows that mechanisms of such interaction (social partnership in the social and labor sphere (tri-partisanship system); public and private partnership; self-regulation) allow to develop the existing resource base, human resources, increase the social responsibility of business and public activity of the population. All these factors, directly and indirectly, affect the development of human capital, whose main carrier is the middle class (both a hard worker and an owner) (Ozina & Chernyshov, 2013).

Based on the analysis conducted, we can say that the respondents assess factors of the quality of life as average, which indicates the possibility of distinguishing the middle class in Russia. At the same time, low scores (below the average) given for some factors (the proactive attitude of the population, the state of road infrastructure and transportation, the insufficient level of infrastructure development (slightly above the average) indicate that the state, business and citizens need to make certain efforts to form a full-fledged middle class in the Russian Federation. Moreover, they should not only increase the incomes of the population but also develop the spheres listed above.

We conducted a small-scale study whose results have not been confirmed yet but they identify a scientific problem that will be fully addressed in the subsequent research. This sociological study involved the self-identification of the respondents as representatives of the middle class in accordance with the realization of their congenital needs and the hierarchy of needs developed by A. Maslow.

The need of people for self-actualization is the highest level of psychological development, i.e. the level of spiritual needs, the desire for personal development and self-realization, the strive for creative activity, the development of one's talents and abilities. Individuals searching for the meaning of life and studying the world around can gain new convictions if their low-level needs are satisfied, which is quite logical.

However, this study demonstrated that the middle class most often includes people who develop vertically rather than horizontally, i.e. they strive for self-realization but their low-level needs are realized only partially.

Most respondents with a college degree who do not consider themselves as representatives of the middle class pay attention only to the first level of needs, even if they seem to be satisfied.

The foregoing can lead to improper conclusions that desires of the next level in A. Maslow's hierarchy of needs appear only after the complete satisfaction of all the previous ones. However, no modern person has their basic needs realized by 100%.

This study assessed the satisfaction of needs among the respondents aged 40 years and older who considered themselves members of the middle class. The results obtained within the framework of the research are presented in Figure 6.

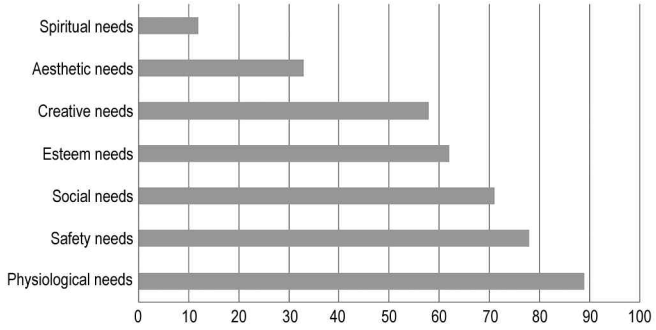


Figure 6. Distribution of the respondents' needs according to A. Maslow's hierarchy

Figure 6 demonstrates that 89% of physiological needs, 78% of security needs, 71% of social needs, 62% of esteem needs, 58% of creative needs, 33% of aesthetic needs and 12% of spiritual needs were satisfied. As we expected, the needs of the lower level are always realized to a greater extent than those that are positioned higher in the hierarchy.

The hierarchy of needs developed by A. Maslow has great philosophical significance and is related to understanding the diversity of human needs and their complex sociocultural relationships. In addition, physiological and safety needs are practically satisfied at the current stage of social development.

Recognition forms self-esteem and determines the feeling of one's need and usefulness for the world. An individual truly develops self-esteem only if they manifest themselves as a self-sufficient person, feel and realize they deserve respect for the results of their work.

Recognition is closely connected with professional activities and can correspond to different spheres, including education, sports training, creativity, implementation of high volumes of work, etc. The need for self-actualization is related to the immediate success in some activity providing the feeling of harmony and revealing one's inborn potential.

We believe an effective tool for analyzing living standards and determining the middle class is the method of hierarchy analysis (paired-comparison method) which reveals the significance of qualitative and quantitative factors for a comprehensive assessment of the quality of life. While selecting a suitable enterprise information system, S.A. Borisov and others presents an approach based on the method of hierarchy analysis that can be applied to determine weighting factors forming the quality of life enjoyed by the population (Borisov et al., 2017).

An important aspect for distinguishing the middle class is a statistical study of income as one of the system-forming factors.

To assess the level of income, we consider intervals for grouping income in constituent entities of the Russian Federation in 2016 (Table 2). In 2016, the maximum cash income per capita was 70,204 rubles (Nenets Autonomous Okrug) and the minimum income per capita was 14,034 rubles (the Tyva Republic), i.e. the difference between the most and least profitable regions

Class interval	Upper interval limit	Number of regions	Cumulative frequency	Frequency
8,417-14,034	14,034	1		0.0122
14,034.1-19,651	19,651	9	10	0.1098
19,651-25,268	25,268	32	42	0.3902
25,268.1-30,885	30,885	21	63	0.2561
30,885.1-36,502	36,502	7	70	0.0854
36,502.1-42,119	42,119	6	76	0.0732
42,119.1-47,736	47,736	2	78	0.0244
47,736.1-53,353	53,353	1	79	0.0122
53,353.1-58,970	58,970	1	80	0.0122
58,970.1-64,587	64,587	1	81	0.0122
64,587.1-70,204	70,204	1	82	0.0122

Table 2. Intervals for grouping income in different regions of the Russian Federation in 2016 (rubles)

was 56,169 rubles. For the purposes of the study, the sum was divided into ten intervals, with the interval length of 5,617 rubles. The average income was estimated at 28,201 rubles and 77 kopeikas.

Based on Table 2, we built a distribution graph in the form of a frequency diagram (histogram). To compare it with normal distribution, we also drew the Gaussian curve and correlated it with the distribution (Figure 7).

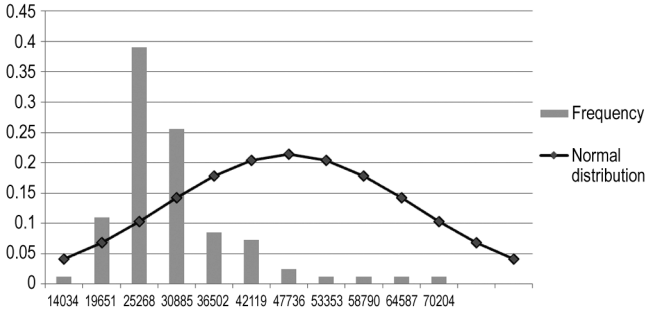


Figure 7. Empirical normality test (using the Gaussian curve)

According to the data presented above, we can conclude that the final distribution is not normal: the sum of frequencies is 10 units below the upper column and 40 units above the upper column, which indicates pronounced right-side asymmetry. This means that the median line of this row is less than the average value. Thus, the number of regions receiving average wages is actually less than the results provided by descriptive statistics.

To calculate the mode and median of this interval, we applied average structural formulas. The mode was determined by the highest frequency. In the stated interval, the mode was as follows:

$$M_0 = x_0 + h\frac{f_{M_0} - f_{(M_0-1)}}{(f_{M_0} - f_{(M_0-1)}) + (f_{M_0} - f_{(M_0+1)})}$$

where M_o is the mode,

x_o is the initial value of the modal interval,

h is the size of the modal interval,

f_{M_o} is the frequency of the modal interval,

$f_{(Mo-1)}$ is the frequency of the interval preceding the modal one,

$f_{(Mo+1)}$ is the frequency of the interval following the modal one,

M_o = 19,651 + 5,617 (32-9)/((32-9) + (32-21)) = 23,451 rubles

The median interval as determined based on cumulative relative frequency (Table 2).

The median line was calculated using the following formula:

$$M_e = x_{Me} + iM_e\frac{\frac{\sum f}{2} - S_{(M_e-1)}}{f_{M_e}}$$

where x_{M_e} is the lower limit of the median interval,

i_{M_e} is the width of the median interval,

$\sum f/2$ is the number of all values divided by two,

$S_{(Me-1)}$ is the total number of observations accumulated before the start of the median interval, i.e. the cumulative pre-interval frequency,

f_{M_e} is the number of observations in the median interval,

M_e = 19,651+ 5,617 (82/2-10)/32 = 25,092 rubles

The calculated data confirm that the distribution achieved through the analysis is asymmetric since the mean value, mode and median are the same in the symmetric distribution. This difference in statistical characteristics shows that real living standards from the viewpoint of income are lower than the statistical results collected but not properly processed. The average regional income of 28,202 rubles per capita is higher than the median value of 25,092 rubles.

4. Conclusion

The study results indicate that the distinction of the middle class in Russia by the average income per capita using statistical methods of calculation, including normal distribution, is practically impossible due to their inconsistency. There is a need for a more comprehensive methodological approach to identify the middle class. Scientifically grounded studies lay the basis for effective managerial decisions aimed at the socio-economic development of the country and characterized by a high level of living standards. In addition, these strategic and tactical decisions should consider not only vertical but also horizontal connections based on partner relations.

References

[1] Bobkov, V.N. (2014). Sotsialnye struktury: srednie klassy i naemnye rabotniki [Social structures: the middle class and hired workers]. *Narodonaselenie*, 1(63), 81-93.

[2] Borisov, S.A., Usov, N.V., & Novikova, V.N. (2017). Primenenie metoda analiza ierarkhii pri vybore naibolee predpochtitelnykh reshenii dlya sovershenstvovaniya informatsionnogo obespecheniya upravleniya predpriyatiem [Applying the method of hierarchy analysis to select the best solutions for improving the data intelligence of enterprise management]. *Ekonomika i predprinimatelstvo*, 2-2(79-2), 552-559.

[3] Chernyshov, A.N. & Chernyshova, A.V. (2011). *Sotsialnoe partnerstvo kak novaya paradigma sotsialno-ekonomicheskogo razvitiya: teoriya i praktika: monografiya* [*Social partnership as a new paradigm of socio-economic development: theory and practice: monograph*]. Nizhny Novgorod: Izd-vo Volgo-Vyatskoi akademii gosudarstvennoi sluzhby.

[4] Giddens, A. (1987). *Social theory and modern sociology*. Cambridge: Policy Press, 1987.

[5] Golubeva, N.V. (2015). *Problemy povysheniya urovnya i kachestva zhizni naseleniya Rossiiskoi Federatsii* [*The issues of improving living standards in the Russian Federation*]. Sovremennye nauchnye issledovaniya i innovatsii, 12. Retrieved from http://web.snauka.ru/issues/2015/12/61821

[6] Kolbanovskii, V.V. (2013). Srednii klass – sotsialnaya realnost, "klass na bumage" ili "obman trudyashchikhsya"? [The middle class as social reality, "a class existing only on paper" or "a lie to workers"?]. *Sotsiologicheskie issledovaniya*, 2, 42-57.

[7] Lapshina, E.N., Yashin, S.N., & Ambartsumyan, A.E. (2018). Integralnaya otsenka innovatsionnogo razvitiya predpriyatiya kak osnova prinyatiya upravlencheskikh reshenii [The integral assessment of the innovative development of business entities as a basis for making managerial decisions]. *Kreativnaya ekonomika*, 12(2), 167-176.

[8] Lavrinenko, V.N. (2012). *Sotsiologiya* [*Sociology*]: student's textbook for universities. Moscow: Yuniti-Dana.

[9] Ofitsialnyi sait Instituta sovremennogo razvitiya [The official website of the Institute of contemporary development]. Retrieved from http://www.insor-russia.ru/ru/news/about_insor/377

[10] Ofitsialnyi sait Vserossiiskogo tsentra izucheniya obshchestvennogo mneniya [The official website of the All-Russian Public Opinion Research Center]. Retrieved from https://wciom.ru/index.php?id=236&uid=116154

[11] Ofitsialnyi sait Finansovogo Universiteta pri Pravitel'stve RF [The official website of the Financial University under the government of the Russian Federation]. Retrieved from http://www.fa.ru/org/div/cos/press/Documents/61_Middle_Class_Poverty_1H_2018.pdf

[12] Otchet "*Global Wealth Report 2015*" [*Global Wealth Report 2015*]. Retrieved from https://www.credit-suisse.com/corporate/en/research/research-institute/global-wealth-report.html

[13] Ozina, A.M. & Chernyshov, A.N. (2013). *Rol sotsialnogo partnerstva v formirovanii sotsialno-ekonomicheskikh uslovii dlya razvitiya chelovecheskogo kapitala: monografiya* [*The role of social partnership in forming social and economic conditions for the development of human resources: monograph*]. Nizhny Novgorod: Izd-vo NIU RANKhiGS.

[14] Sadykov, R.M. (2014). Uroven i kachestvo zhizni naseleniya kak faktor obespecheniya sotsialnoi bezopasnosti territorialnykh obrazovanii [Living standards as a factor ensuring the social security of territorial entities]. *Fundamentalnye issledovaniya*, 11(1), 201-205.
[15] Shapovalov, A.A. (2017). Srednii klass trebuet novoi raboty [The middle class requires new jobs]. *Gazeta Kommersant*. Retrieved from https://www.kommersant.ru/doc/2438702
[16] Slepukhin, A.Yu. & Chaplygin, A.E. (2011). Uroven samoidentifikatsii kak subektivnyi kriterii otneseniya individa k rossiiskomu srednemu klassu [The level of self-identification as a subjective criterion for identifying an individual as a member of the Russian middle class]. *Vestnik Saratovskogo gosudarstvennogo tekhnicheskogo universiteta*, 4(2(60)), 309-312.
[17] Somenkova, N.S. & Zakharova, S.G. (2019). Kriterii otsenki effektivnosti deyatelnosti gosudarstvennykh i munitsipalnykh organov vlasti Rossiiskoi Federatsii i ikh vzaimosvyaz s povysheniem kachestva zhizni naseleniya [The criteria for evaluating the effectiveness of state and municipal authorities of the Russian Federation and their contribution to improving living standards]. *Finansovaya ekonomika*, 3, 296-301.
[18] Thompson, W. & Hickey, J. (2005). *Society in Focus*. Boston, MA: Pearson.
[19] Tsentr strategicheskikh issledovanii (TsSI) Rosgosstrakha. Ofitsialnyi sait [The Center for Strategic Studies of Rosgosstrakh. The official website]. Retrieved from https://www.rgs.ru/pr/csr/index.wbp
[20] Tsimbalist, A.V. (2014). Kriterii otneseniya grupp naseleniya k srednemu klassu [Criteria to including different groups of the population into the middle class]. *Vestnik Omskogo regionalnogo instituta*, 1, 141-146.
[21] Zakharova, S.G. (2016). Sotsialno-orientirovannoe upravlenie chelovecheskimi resursami selskikh munitsipalnykh raionov i ego vliyanie na kachestvo zhizni naseleniya [The social-oriented management of human resources in municipal districts and its influence on living standards]. *Vestnik Nizhegorodskogo universiteta im. N.I. Lobachevskogo*, 3, 7-16.
[22] Zakharova, S.G. (2017a). Factorial approach to population quality of life management. *International Journal of Professional Science*, 1, 33-40.
[23] Zakharova, S.G. (2017b). Faktornyi podkhod k upravleniyu kachestvom zhizni naseleniya: sotsiologicheskii aspekt [The factorial approach to managing living standards: the sociological aspect]. *Ekonomicheskie issledovaniya i razrabotki*, 1, 70-77.
[24] Zakharova, S.G. & Borisov, S.A. (2018). Otsenka uslovii formirovaniya srednego klassa Rossii s pozitsii faktornoi modeli upravleniya kachestvom zhizni naseleniya [The assessment of conditions for forming the middle class in Russia based on the factorial model of managing living standards]. *Vestnik Nizhegorodskogo universiteta im. N.I. Lobachevskogo*. *Seriya: Sotsialnye nauki*, 1(49), 14-25.
[25] Zakharova, S.G. & Maltsev, A.N. (2016). Otsenka sistemy upravleniya munitsipalnykh raionov po kriteriyu kachestva zhizni naseleniya [Assessing the system of managing municipal districts in conformity with criteria for determining the quality of life]. *Vlast*, 8, 67-73.

The Satisfaction Level of Foreign Tourists in Indonesia

Dita AMANAH [1*], Fauzia AGUSTINI [2], Dedy Ansari HARAHAP [3]

[1] Universitas Pendidikan Indonesia, Indonesia; E-mail: ditaamanah@upi.edu
[2] Universitas Negeri Medan, Indonesia; E-mail:fauziaagustini24@gmail.com
[3] Universitas Islam Bandung, Indonesia; E-mail: dedyansari@unisba.ac.id
[*] Corresponding author

Abstract

Tourist satisfaction needs to be considered for developing a country's tourism. This paper attempt to analyze the level of satisfaction of foreign tourists towards the elements of tourism development. The study focuses in Medan, the third largest city in Indonesia, which is known as Paris Van Sumatra. A total of 100 foreign tourists from 28 countries became respondents in this study, which was then analyzed by the CSI method (Customer Satisfaction Index). Respondents were obtained through purposive sampling techniques, that is foreign tourists who had visited Medan. The data came from distributing questionnaires to foreign tourists. The elements of tourism development that are measured are infrastructure, accommodation and promotion. The results of the Customer Satisfaction Index analysis found that the satisfaction of foreign tourists obtains a score of 61.73%. The results are in the range of 51-65%. This shows foreign tourists feel quite satisfied with the infrastructure, accommodation and promotion of tourism in Medan. Based on the level of expectations of foreign tourists, the infrastructure received the highest score (312.50) compared to other tourism development elements (accommodation and promotion). That is, tourists really expect better infrastructure in Medan viz. road conditions, telephone networks, hospitals, offices, bridges, etc. This article tries to provide recommendations to government regarding elements of tourism development such as infrastructure, accommodation, promotion, especially the emphasis on infrastructure improvements. This article tries to provide recommendations to government regarding elements of tourism development such as infrastructure, accommodation, promotion, especially the emphasis on infrastructure improvements. If the government manages the elements of tourism well, it will give satisfaction to tourists.

Keywords: *satisfaction; tourism development; infrastructure; accommodation; promotion; customer satisfaction index; Indonesia.*

1. Introduction

The company's ability to give satisfaction to customers is the main thing by providing quality products, affordable prices, faster product delivery or better service than competitors. Today, the best strategy to fight competitors is to give satisfaction to customers. Companies that are able to provide more satisfaction than competitors will gain competitive advantage in the market. Satisfied customers tend to be loyal, buy more often and are willing to pay more for certain products or services. In the end satisfaction will create consumer loyalty. Likewise with the tourism sector. If a customer is satisfied, it is likely that the company will get new customers because they will usually share their satisfaction experiences with others (Kotler & Armstrong, 2016).

To create customer satisfaction, companies must be able to provide superior service, which is different from competitors. Service quality has become a very dominant factor in the success of the company because superior service will maintain customer trust and also form a strong organizational culture where employees are challenged to demonstrate potential, recognized and valued. Components of these core values that can drive the success of the company (Schermerhorn, 2013).

The development of tourism in Medan has always been a concern for researchers because Medan is a city that has many attractions. Ideally, with a large number of tourism objects, it would certainly increase regional income. However, most of these attractions have not been managed properly by the government Amanah (2016), so it is not relevant to the number of visitors who come to Medan (Amanah, Hurriyati, Gaffar, Agustini, & Harahap, 2018). Service improvements as well as other supporting factors need to be observed by stakeholders to fix deficiencies and if corrected, it is not impossible to increase the number of visitors and become one of the most popular tourist objects in Medan and even Indonesia. Especially at this time the government is promoting tourism which is one of the development sectors in Indonesia. The role of tourism is very important in the development of Indonesia because it contributes to the country's foreign exchange, as an engine of the economy and at the same time reduces unemployment, especially for people who stay around tourist destinations. Medan, which has a lot of historical heritage, was not able to absorb tourists. Even if there are tourists who come, then they only make Medan a transit city or stay overnight before continuing to visit such as Nias, Samosir, Berastagi, Aceh and West Sumatra (Rama, 2018). The tourism sector in Medan is still very concerning, until now it is still a transit area for tourists. He also stated that Medan has a lot of tourism potential which if managed properly will be able to increase the original regional income (PAD) of Medan (Purnomo, 2015). Other evidence states that tourism objects in Medan still need to be evaluated and addressed is (Agustini, 2009). She concluded that visitors were not satisfied with Medan zoo management. There are six variables that need to be addressed, namely animals, cleanliness, security, services, facilities and other developments in Medan Wildlife Park (Amanah, 2015).

Based on the description of the previous problems, the satisfaction of foreign tourists will affect the interest of tourists to make a repeat visit. Therefore, the measurement of satisfaction of foreign tourists towards tourism objects in Medan is very important to be done in order to identify some lacks and weaknesses of tourist objects that need improvement and find the right strategies to increase Indonesian tourism.

2. Literature review

2.1. Customer Satisfaction

The word satisfaction comes from the Latin "satis" (meaning quite good, adequate) and "facio" (doing or making). Satisfaction can be interpreted as an effort to fulfill something or make something adequate. Services are closely related to efforts to increase customer satisfaction so that the services provided to customers can satisfy them. Today the attention to satisfaction has been greater, the competition is getting tighter so that more and more companies are involved in meeting the needs and desires of consumers which causes each company to be placed and oriented to consumers as the main goal. Everyone would want to meet their needs and want to feel satisfaction in accordance with their expectations. The level of consumer satisfaction is clearly different from each other. Therefore, companies need to make continuous efforts to improve customer satisfaction and become things that cannot be forgotten.

According to Kotler & Keller (2016), satisfaction is the level of individual feelings after comparing perceived performance with expectations. Whereas Tse & Wilton (1988), customer satisfaction or dissatisfaction is the customer's response to the evaluation of discrepancies that are felt between previous expectations and the actual performance of the product that is felt after use. Satisfaction is the consumer's response to the fulfillment of needs. This means that the assessment of the privileges of a product or service provides a level of comfort related to fulfilling needs, including fulfilling the needs below expectations or beyond the needs of consumers (Oliver, 1980). The customer's emotional response to the experience of using certain products or services will create customer satisfaction (Park, Heo, & Rim, 2008). Customers have an evaluation process and at least they expect the experience to be received as expected (Czeplel & Ph, 1978).

Customer satisfaction is the customer's response to the fulfillment of needs, so they get a sense of pleasure. An assessment of the privileges/advantages of a particular product or service can provide a level of comfort related to fulfilling needs, including those that meet expectations or even exceed customer expectations. Satisfied customers are customers who feel they get value from the use of products/services (Swastha, 2014). Value for customers is a quality product, so satisfaction occurs when customers get quality products and tend to recommend these qualities to others.

Based on some understanding of satisfaction above, concluded that tourist satisfaction is a pleasant feeling experienced by tourists after visiting certain attractions. These pleasant feelings arise after comparing the service performance received by tourists comparing with their expectations of the tourist attraction. The better the perceived performance of tourists compared to expectations, the higher the level of tourist satisfaction.

2.2. Elements of tourism development

According to (Spillane, 2005), from the economic aspect, tourism development will create jobs. Natural tourism requires relatively greater investment for the construction of facilities and infrastructure. For this reason, an accurate evaluation of these natural tourism activities is needed. Many opinions state that natural tourism in the form of ecotourism has not succeeded in acting as a tool for nature conservation and for developing the economy. One of the causes is the difficulty in obtaining funds for developing activities. The management of natural tourism areas uses a lot of funds from tourism revenue from visitors as a mechanism to return the costs of managing and preserving natural tourism activities has not been achieved optimally.

The main elements should get attention in order to support tourism development in tourist destinations concerning planning, implementation of development and development covering three elements, which are infrastructure, accommodation, promotion. Infrastructure is a situation that supports the function of tourism facilities and infrastructure, both in the form of regulatory systems and physical buildings above ground and underground. Tourist accommodation is important in keeping the needs of tourists who are traveling. The tourists tend to require accommodation that has a variety of price and types. Primary accommodation needed by tourists is a place to stay when they travel. Accommodation or tourist facilities are complete facilities owned by tourist destinations to serve the needs of tourists in enjoying their tour. Accommodation is something that is provided to comply the needs of tourists, such as places to stay or temporary residences for people who travel (Suwithi & Boham, 2008). Tourist accommodation can be a place where tourists can rest, stay, bathe, eat, drink and enjoy the services. According to the Minister of Tourism's Decree No.37 / PW.304 / MPT / 86, accommodation is a place of accommodation equipped with other services such as food and drink services. Examples of accommodations are hotels, bungalows, inns, and so on. There are several types of tourist accommodation that are commonly used for commercial purposes, such as hotels, motels, guest houses, youth hostels, apartments, sanatorium, pension, bungalow, ryokan, mess, homestay, inns, inn, hozzpiz, cot.

Promotion according to Novak (2011) is the activity of introducing products, convincing and reminding the product to the target of the buyer, hope that they are moved and willing to buy products. The benefits of the product are communicated and simultaneously persuade the target consumer to buy the product (Kotler & Armstrong, 2014). The purpose of promotion is to inform, influence and persuade and remind target customers about the company and the marketing mix (Helaey, 2013). Tourist attractions require promotion to be known throughout the world. The more frequent promotions are carried out, the greater the scope of information about tourism places is known by people around the world that make tourists interested in visiting these tourist attractions. Promotion possible to do by advertising, sales promotion, public relations, direct marketing and personal sales that can be used to attract tourists (Karunanithy & Sivesan, 2013).

3. Research methodology

This research was carried out in Medan, especially in the area of Istana Maimun Medan, this is because generally foreign tourists who come to Medan will visit the Istana Maimun. It located on Jalan Brigjend. Katamso Medan. The population in this study were foreign tourists visiting Medan with a sample of one hundred respondents, that is foreign tourists who had settled a few days in Medan with purposive sampling as sampling techniques. Data was collected through questionnaires which were then analyzed using the CSI method (Customer Satisfaction Index). CSI provides clear data to researchers regarding the level of customer satisfaction so in certain periods researchers can evaluate customer satisfaction and the company can also correct deficiencies and improve service to customers. Related to this study, the researchers obtained data on the satisfaction level of foreign tourists so researchers could evaluate their satisfaction. In addition, the government can also correct deficiencies and further improve services to foreign tourists. CSI results become an input for the company to maintain sustainability and simultaneously control the business in terms of the customer aspect (Park et al., 2008). Thus, the CSI results provide input to the government and tourism managers to increase Medan tourism in terms of tourists' perceptions. The CSI measurement method includes the following stages:

1. Calculating Weighting Factor (WF), which is to change the average score of importance to a percentage of the total average level of importance of all attributes tested, so that a total WF of 100% is obtained.
2. Calculating Weighting Score (WS), which is the score of the multiplication between the average value of the performance level (satisfaction) of each attribute with the WF of each attribute.
3. Calculating Total Weighting (WT), which is summing the WS of all service quality attributes.
4. Calculating the Satisfaction Index, that is WT divided by the maximum scale used (in this study the maximum scale is 5), then multiplied by 100%.

To calculate the level of customer satisfaction based on CSI, the following formula is used

$$CSI = \frac{\sum_{j=1}^{k}\sum_{i=1}^{n} C_i \times X_i}{k \times n}$$

Explanation:
i = survey indicator number-i
j = respondent number - j
k = total of sample/respondent
n = total of survey indicator
C_i = weight of indicator number - i
X_i = score of indicator number - i

The satisfaction level of respondents as a whole can be seen from the criteria of the level of customer satisfaction in Table 1, with the following criteria:

Table 1. Customer Satisfaction Index (CSI)

No.	CSI scores (%)	Classification
1.	81% - 100%	Very satisfied
2.	66% - 80.99%	Satisfied
3.	51% - 65.99%	Quite satisfied
4.	35% - 50.99%	Less satisfied
5.	0 - 34.99%	Not satisfied

4. Analyses and results

4.1. Respondent characteristics

Respondents in this study consisted of foreign tourists from various countries (Table 2). From 100 questionnaires collected, foreign tourists came from 28 countries and most of them came from the Netherlands with a total of 15 respondents.

Table 2. Tourist Country of Origin

No.	Country	Number of respondents
1	Switzerland	9
2	Malaysia	8
3	Germany	3
4	Vietnam	1
5	Hong Kong	1
6	Belgium	3
7	U.S.A	10
8	Australia	7
9	India	2
10	Canada	4
11	China	1
12	Estonia	1
13	Netherlands	15
14	France	5
15	UK	7
16	Spain	2
17	Chili	1
18	England	5
19	Thailand	3
20	Yemen	1
21	Finland	1
22	Japan	3
23	Singapore	1
24	Aruba	1
25	Russia	2
26	Ireland	1
27	Iran	1
28	Brazil	1
	Total	100

Respondents consisted of 58 men and 42 women. 48 respondents aged under 30 years and 52 respondents over 30 years old. Most of the respondents have undergraduate education background that is 48 respondents while Senior High School 18 respondents, postgraduate 28 respondents and others 6 respondents. Most respondents work as company employees (48), 20 entrepreneurs, 13 students and 19 for others. A total of 27 respondents stated that they got information about Medan through friends, 10 from their family, from advertisements of 16 respondents, while 47 others were not known the source. Then, a number of 65 respondents stated one visit to Medan while the rest (35) stated more than once visit to Medan. Respondents who were satisfied totaled 76 respondents while 24 expressed dissatisfaction (Table 3).

Personal data	Total (respondents)		Percentage
Gender	Male	58	58
	Female	42	42
Age	Below 30	48	48
	Above 30	52	52
Education	Senior High School	18	18
	Bachelor	48	48
	Post graduate	28	28
	Others	6	6
Occupation	Entrepreneur	20	20
	Employee	48	48
	Student	13	13
	Others	19	19
Source of information about Medan	Friends	27	27
	Family	10	10
	Advertisement	16	16
	Others	47	47
Frequency of arrival	Once	65	65
	More than once	35	35
Satisfaction visit to Medan	Yes	76	76
	No	24	24

Table 3. Respondents' Personal Data

4.2. Respondent Satisfaction Level on Infrastructure, Accommodation and Tourism Promotion in Medan

Researchers have managed to gather the opinions of respondents about the infrastructure, accommodations and promotions related to tourism in Medan. Analysis of the level of

No.	Statements	Level of importance/ expectations					Total of frequency
		1	2	3	4	5	
1.	The traffic in Medan is not crowded	0	17	15	41	27	100
2.	The infrastructure (such as hospitals, post office, bridge, road, etc.) in Medan is on the right location	21	4	60	11	4	100
3.	Condition of the telephone network in Medan is good	6	30	50	13	1	100
4.	Condition of Medan's road is good	0	32	27	32	9	100
5.	There are many places in Medan for sightseeing	1	20	38	28	13	100
6.	The accommodation (such as hotels, motels, cafe, restaurant) in Medan is in strategic place	5	55	32	5	3	100
7.	Service in hotel or motel is good	9	52	25	11	3	100
8.	The hotel or motel where you stayed have an affordable rates	11	62	11	15	1	100
9.	Promotion about tourism in Medan is suitable with the reality	4	31	49	13	3	100
10.	Medan Government have ever promoted about the tourism of Medan	2	13	64	15	6	100
11.	Medan Government provided information about tourism in Medan	3	13	58	22	4	100
12.	You know about tourism in Medan based upon brochure	7	26	31	33	3	100

Table 4. Results of Analysis of Importance/Hope of Foreign Tourists

importance and performance was carry out to find out how far the expectations or desires of tourists and perceived performance of the statement being assessed. In Table 4 above shows each answer from foreign tourists about their expectations of the elements of Medan tourism development.

Based on Table 5 below, variables that have a level of importance with the lowest average value is the accommodation variable (2.65) while the variable that has the highest average level of importance is the infrastructure variable (3.13). The statement on the infrastructure variable that obtains the highest average value is the traffic in the first statement (3.78), while the eighth statement has the lowest average value (2.33).

No.	Statements	Importance/ expectations	Total respondents	Average
1.	The traffic is not crowded	378	100	3.78
2.	The infrastructure (such as hospitals, post office, bridge, road, etc.) is on the right location	281	100	2.81
3.	Condition of the telephone network is good	273	100	2.73
4.	Condition of road is good	318	100	3.18
Infrastructures				3.13
5.	There are many places for sightseeing	332	100	3.32
6.	The accommodation (such as hotels, motels, cafe, restaurant) is in strategic place	246	100	2.46
7.	Service in hotel or motel is good	247	100	2.47
8.	The hotel or motel where you stayed have an affordable rates	233	100	2.33
Accommodations				2.65
9.	Promotion about tourism is suitable with the reality	280	100	2.80
10.	Government have ever promoted about the tourism	310	100	3.10
11.	Government provided information about tourism	311	100	3.11
12.	You know about Medan tourism based upon brochure	299	100	2.99
Promotions				3.00

Table 5. Average Level of Importance/Hope of Foreign Tourists

In Table 6 below shows the results of the performance analysis of elements of Medan's tourism development. Assessed performance is a feeling felt by foreign tourists while in Medan.

In Table 7 it can be seen that the accommodation variable has the highest average performance level (3.44) while the infrastructure variable has the lowest average value (2.94). There is a little difference between the infrastructure variable and the promotion which is 0.09 where the promotion variable has an average value of 3.03. The statement from tourists who have the highest level is the eighth statement that is about hotel rates with an average value of 3.81 while the lowest statement is the first statement with an average value of 2.28 which is about traffic.

No.	Statements	Level of performance					Total of frequency
		1	2	3	4	5	
1.	The traffic is not crowded	27	39	15	17	2	100
2.	The infrastructure (such as hospitals, post office, bridge, road, etc) is on the right location	2	12	62	0	24	100
3.	Condition of the telephone network is good	1	13	48	32	6	100
4.	Condition of road is good	9	31	27	31	2	100
5.	There are many places for sightseeing	13	28	36	22	1	100
6.	The accommodation (such as hotels, motels, cafe, restaurant) is in strategic place	1	5	34	53	7	100
7.	Service in hotel or motel is good	1	10	25	53	11	100
8.	The hotel or motel where you stayed have an affordable rates	1	4	21	61	13	100
9.	Promotion about tourism is suitable with the reality	3	13	47	33	4	100
10.	Government have ever promoted about the tourism	6	15	62	13	4	100
11.	Government provided information about tourism	4	22	57	12	5	100
12.	You know about Medan tourism based upon brochure	2	32	32	27	7	100

Table 6. Performance Level Analysis of Medan Tourism Development Elements

No.	Statements	Level of performance	Total of respondents	Average
1.	The traffic is not crowded	228	100	2.28
2.	The infrastructure (such as hospitals, post office, bridge, road, etc) is on the right location	332	100	3.32
3.	Condition of the telephone network is good	329	100	3.29
4.	Condition of road is good	286	100	2.86
Infrastructures				2.94
5.	There are many places for sightseeing	270	100	2.70
6.	The accommodation (such as hotels, motels, cafe, restaurant) is in strategic place	360	100	3.60
7.	Service in hotel or motel is good	363	100	3.63
8.	The hotel or motel where you stayed have an affordable rates	381	100	3.81
Accommodations				3.44
9.	Promotion about tourism is suitable with the reality	322	100	3.22
10.	Government have ever promoted about the tourism	294	100	2.94
11.	Government provided information about tourism	292	100	2.92
12.	You know about Medan tourism based upon brochure	305	100	3.05
Promotions				3.03

Table 7. Average Level of Performance of Medan Tourism Development Elements

No.	Statements	Importance/ expectations (X)	Performance (Y)	Conformity level (%) Y/X*100%
1.	The traffic is not crowded	378	228	60.32
2.	The infrastructure (such as hospitals, post office, bridge, road, etc.) is on the right location	281	332	118.15
3.	Condition of the telephone network is good	273	329	120.51
4.	Condition of road is good	318	286	89.94
Infrastructures		312.50	293.75	97.23
5.	There are many places for sightseeing	332	270	81.33
6.	The accommodation (such as hotels, motels, cafe, restaurant) is in strategic place	246	360	146.34
7.	Service in hotel or motel is good	247	363	146.96
8.	The hotel or motel where you stayed have an affordable rates	233	381	163.52
Accommodations		264.50	343.5	134.54
9.	Promotion about tourism is suitable with the reality	280	322	115.00
10.	Government have ever promoted about the tourism	310	294	94.84
11.	Government provided information about tourism	311	292	93.89
12.	You know about Medan tourism based upon brochure	299	305	102.01
Promotions		300.00	303.25	101.44

Table 8. Conformity between Level of Expectation and Performance in each of the Elements of Medan Tourism Development

Table 8 shows the results of the level of suitability between the importance/expectations of foreign tourists and the performance of elements of Medan's tourism development. These results indicate the level of satisfaction of foreign tourists. There are seven statements that have reached even more than 100% (statements 2, 3, 6, 7, 8, 9, 12). The eighth statement got the highest level of suitability regarding the elements of tourism development for foreign tourists analyzed, that is 163.52%, the seventh statement (146.96%), the sixth statement (146.34%), the third statement (120, 51%), the second statement (118.15%), the ninth statement (115%) and the twelfth statement (102.01%). This shows that foreign tourists are satisfied with the seven statements. Whereas for the other five statements still do not satisfy the tourists expectation, because the percentage level of suitability is below 100%.

In general, the satisfaction level of foreign tourists towards the infrastructure, accommodation and tourism promotion of Medan was quite satisfied with 0.6173 (61.73%) as shown in Table 9.

Statements	Importance level score (X)	Performance level score (Y)	Scores X x Y
1.	3.78	2.28	8.62
2.	2.81	3.32	9.33
3.	2.73	3.29	8.98
4.	3.18	2.86	9.09
5.	3.32	2.70	8.96
6.	2.46	3.60	8.86
7.	2.47	3.63	8.97
8.	2.33	3.81	8.88
9.	2.80	3.22	9.02
10.	3.10	2.94	9.11
11.	3.11	2.92	9.08
12.	2.99	3.05	9.12
Total	35.00	37.62	108.02

Table 9. Customer Satisfaction Index (CSI) Attributes

5. Discussions, Contributions, Limitations

5.1. Discussions

Based on the Customer Satisfaction Index, the satisfaction of foreign tourists towards Medan tourism is 61.73%. This shows that foreign tourists feel quite satisfied with the infrastructure, accommodation and tourism promotion in Medan. For infrastructure, this research is in line with (Mandić, Mrnjavac, & Kordić, 2018). They found a significant correlation between the tourist object life cycle and the number of arrivals, stays and infrastructure conditions of the tourist attraction in Croatia. The condition of tourist attraction greatly influences the demand and expectations of visitors. Financial limitations have caused tourism managers to ignore infrastructure development. Managers expect private parties to work together to improve tourism infrastructure, especially in tourist attractions. Supported by Blazeska & Klimoska (2018). They used a sample of 200 foreign tourists studied for one month in Ohrid, one of the cities in Macedonia. Ohrid is famous for the natural and cultural wealth that has interesting attractions such as Lake Ohrid and also natural and cultural monuments. They found that tourism infrastructure had a major influence on the satisfaction of foreign tourists. The Ohrid government cooperates with the Macedonian government in developing tourism infrastructure. Tourism development, intensive investment in infrastructure is increasingly needed in developing a country's tourism. The development of tourism infrastructure contributes to the level of tourist satisfaction and simultaneously increases the competitiveness of tourism objects. Croatia, Slovenia, Hungary is a Southeast European country that has the highest level of tourism competitiveness. The only country that has experienced a decline in tourism competitiveness is Serbia. While Bosnia Herzegovina, Macedonia is a country that has experienced increased tourism competitiveness. Tourism infrastructure that most influences the satisfaction of tourists in Southeast Europe is that managers increase the number of hotel rooms from year to year (Jovanović & Ilic, 2016).

In addition to infrastructure, accommodation is also an important part of tourism. The results of this study conclude that accommodation influences the satisfaction of foreign tourists. This is in line with (Batista, Couto, Botelho, & Faias, 2014). They conducted an explanatory study of 107 tourists who visited Sao Miguel, Portugal for 5 months. The results show that the quality of service and management of hotel complaints are the main variables that affect tourist satisfaction. They also found factors that influence tourist loyalty such as affective commitment, satisfaction, price, complaint management and hotel image. The hotel can use this factor to maximize satisfaction so that it adds value to tourists and creates loyalty. Supported by Al-Ababneh (2013) who concluded that tourist satisfaction is strongly influenced by the quality of service (facilities, accessibility and tourist attractions). He conducted a study of 180 tourists who visited Petra, an archaeological site in Ma'an, Jordan. It was explained that the quality of service has a positive relationship to tourist satisfaction. Improved services (facilities, access and attractions) will increase tourist satisfaction. Understanding the needs of hotel guests, paying special attention to them, special knowledge of hotel staff, serving hotel guests quickly and correctly, providing highly memorable services are attributes that are considered important in creating tourist satisfaction on Cape Coast and Elmina, Ghana. All of these attributes have special implications for hotel management and overall for the hospitality

and tourism industry. To achieve tourist satisfaction, high coordination is needed in all aspects (Amissah, 2013).

Tourism is closely related to promotion. Tourism promotion will inform people about certain tourism objects. Thus the tourist attraction will be better known and visited by tourists. The results of this study state that promotion affects the satisfaction of foreign tourists. This is in line with Khan (2016) which states that promotion affects tourist satisfaction. Four promotional mixes that were analyzed like advertising, sales promotion, publicity, direct marketing. Only direct marketing has no significance in creating tourist awareness and also has no significant influence on tourist satisfaction. They analyzed 200 tourists who visited Mussoorie hill station in Dehradun, India, which is one of the famous summer attractions in Uttarakhand. In one of the recommendations, they stated that the information in the brochure should be translated into several major foreign languages in the world so that tourists better understand the tourist objects. Supported by (Aldebi & Aljboory, 2017) which states that a promotional mix is needed to create satisfaction and forth can form the image of a tourist object on the perception of tourists. They find varied results for each promotional mix. Advertising that have the most influence on tourist image, while sales promotion has the least influence on the tourist image. Also found differences in tourist perceptions of elements of the promotion mix from the national aspect. They recommend promotion through social networking sites to attract tourists to Jordan. Promotion plays an important role in the development of tourism in Finland which is one country that has natural beauty. The number of tourists increases every year but still fails to fulfill the expectations of tourists. This is due to no access during the winter and Christmas as well as the country that have not so widely known. Therefore promotion is needed to attract more tourists to visit this country. It was found that the use of social media was not very effective. Tour operators are less favor and less interested in social media. Therefore promotion through social media needs more aggressively to disseminate information about Finland, especially Lapland, which is a tourist attraction that still has the sun even at night (Hasan, 2015).

5.2. Contribution of study

The manager of tourism objects and the government can use the results of this study as material for consideration to establish policies in developing Indonesian tourism, especially Medan. Infrastructure, accommodation and promotion attributes are used to measure the level of tourist satisfaction in this study. The performance of tourist objects and government services is needed in the development of elements of Indonesian tourism. Furthermore, the results of this study can be a reference for government policies in the tourism industry related to infrastructure, accommodation and promotion. Another benefit from the aspect of education is to be an additional reference in the field of marketing, especially tourism, in creating tourist satisfaction.

5.3. Limitations and further research

This research is based on tourist satisfaction which may be lacking information that is given by respondents when filling out questionnaires that could have an impact on data analysis and interpretation. The respondents' doubts to convey their answers and themselves actually became one of the limitations of this study. The number of samples that are less representative, so that the findings cannot be generalized to all tourism problems in other countries by considering only three attributes (infrastructure, accommodation, promotion) which of course other attributes can be included in further research such as cultural attractions, hospitality of the local community , transportation to the city, transportation between tourist destinations. More precise analysis methods are recommended to obtain more accurate results.

6. Conclusion

Indonesia is very concerned about tourist satisfaction because they contribute to the country's foreign exchange. Various efforts have been made by the government to increase Indonesian tourism. However, from the results of the study found that there are still many improvements that need to be done to get tourist satisfaction. The results showed the level of satisfaction of foreign tourists visiting Medan felt quite satisfied with the infrastructure, accommodation and tourism promotion. There are seven attributes that indicate the level of performance meets the level of expectations of foreign tourists, such as infrastructure, telephone network, accommodation, hotel services, hotel rates, promotions in accordance with their practice and promotion through brochures. While the other five attributes have not met the expectations of foreign tourists visiting Medan i.e. traffic, road conditions, tourist attractions, promotion by the local government, information by the local government. Medan government must constantly make evaluations and continuous improvements to infrastructure, accommodation and tourism promotion.

It is expected that tourists, especially foreign tourists more visit Indonesia, especially Medan, if the government made some improvements as suggested in this study. Public awareness and also other related elements are required to jointly realize Indonesia's tourism goals. More tourists visit Indonesia, it will give more benefits to the government and more prosperous people around the tourist attraction.

References

[1] Agustini, F. (2009). *Analisis Sikap Konsumen Terhadap Kebun Binatang Medan (KBM) Sebagai Lokasi Potensi Pariwisata Di Kota Medan*. Medan.

[2] Al-Ababneh, M. (2013). Service Quality and Its Impact on Customer. *Interdisciplinary Journal of Contemporary Research in Business*, 4(12), 164-177.

[3] Aldebi, H., & Aljboory, N. (2017). The Impact of the Tourism Promotion-Mix Elements on the Foreign Tourists' Mental Images of the Jordanian Tourist Destinations (A Field Study). *International Business Research*, 11(1), 74. https://doi.org/10.5539/ibr.v11n1p74

[4] Amanah, D. (2015). SWOT Analysis of the Wildlife Park of Medan, Indonesia. *International Journal of Economics, Commerce and Management United Kingdom*, III(10), 500-509. Retrieved from http://ijecm.co.uk/

[5] Amanah, D. (2016). Product Development Strategy of the Wildlife Park of Medan, Indonesia. *The International Journal of Business & Management*, 4(7), 376-382.

[6] Amanah, D., Hurriyati, R., Gaffar, V., Agustini, F., & Harahap, D. A. (2018). Foreign tourist's attitude to the elements of the developing of tourism in Medan, Indonesia. *Management Science Letters*, 8(5), 371-380. https://doi.org/10.5267/j.msl.2018.4.009

[7] Amissah, E. F. (2013). Tourist Satisfaction with Hotel Services in Cape Coast and Elmina, Ghana, *American Journal of Tourism Management*, 2, 26-33. https://doi.org/10.5923/s.tourism.201304.03

[8] Batista, M. da G., Couto, J. P., Botelho, D., & Faias, C. (2014). Tourist satisfaction and loyalty in the hotel business: An application to the island of São Miguel, Azores. *Tourism & Management Studies*, 10(1), 16-23. Retrieved from http://www.scielo.gpeari.mctes.pt/scielo.php?script=sci_arttext&pid=S2182-84582014000100003&lng=en&tlng=en

[9] Blazeska, D., & Klimoska, A. M. (2018). The Influence of Tourist Infrastructure on the Tourist Satisfaction in Ohrid, *UTMS Journal of Economics*, 9(1), 85-93.

[10] Czeplel, J. A., & Ph, D. (1978). Consumer Satisfaction: Concept and Measurement. *Journal of Academy of Marketing Science*, 5(4), 403-411.

[11] Hasan, M. A. (2015). *Promotional Activities in the Strategic Tourism Development of Lapland*, (June). Retrieved from https://www.theseus.fi/bitstream/handle/10024/96778/Final thesis Hasan 2.pdf?sequence=1&isAllowed=y%0Ahttps://www.theseus.fi/bitstream/handle/10024/96778/Final thesis Hasan 2.pdf?sequence=1

[12] Helaey, S. C. (2013). Marketing Module Series. In Cornel University (Ed.), *Marketing Module 8: Promotion*. Ithaca.
[13] Jovanović, S., & Ilic, I. (2016). Infrastructure as important determinant of tourism development in the countries of Southeast Europe. *Ecoforum*, 5(1), 288-294.
[14] Karunanithy, M., & Sivesan, S. (2013). An empirical study on the promotional mix and brand equity: Mobile service providers. *Industrial Engineering Letters*, 3(3), 1-9. https://doi.org/2225-0581
[15] Khan, M. S. (2016). Impact Of Promotional Mix Elements On Tourist's Satisfaction: A Case Study of Mussoorie. *International Journal of Research in Commerce and Management*, 7(4), 4-8. Retrieved from http://eds.b.ebscohost.com.liverpool.idm.oclc.org/eds/pdfviewer/pdfviewer?vid=1&sid=ae1dbf4a-2eb9-4806-b15b-c557429ee117%40sessionmgr101
[16] Kotler, P., & Armstrong, G. (2014). *Marketing: An Introduction* (Global ed.). New Jersey: Pearson Education Limited.
[17] Kotler, P., & Armstrong, G. (2016). *Principles of Marketing*: Global Edition (16th ed.). England: Pearson Education Limited.
[18] Kotler, P., & Keller, K. L. (2016). *A Framework for Marketing Management* (6th ed.). England: Pearson Education Limited.
[19] Mandić, A., Mrnjavac, Ž., & Kordić, L. (2018). Tourism Infrastructure, Recreational Facilities and Tourism Development. *Tourism and Hospitality Management*, 24(1), 1-22. https://doi.org/10.20867/thm.24.1.12
[20] Novak, D. (2011). Promotion as Instrument of Marketing Mix. *I International Symposium Engineering Management and Competitiveness*, 2011, 505-510. Retrieved from http://www.tfzr.uns.ac.rs/emc/emc2011/Files/G 06.pdf
[21] Oliver, R. L. (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research*, 17(4), 460-469. https://doi.org/10.2307/3150499
[22] Park, Y., Heo, P., & Rim, M. (2008). Measurement of a Customer Satisfaction Index for Improvement of Mobile RFID Services in Korea, *Etri Journal*, 30(5), 634-643. https://doi.org/10.4218/etrij.08.1308.0059
[23] Purnomo, S. (2015). Medan Zoo, Aset Wisata Kota Medan yang Terlantar. Retrieved January 4, 2015, from http://harian.analisadaily.com/opini/news/medan-zoo-aset-wisata-kota-medan-yang-terlantar/95289/2015/01/05%0A%0A
[24] Rama, F. (2018). Tempat Wisata Sejarah di Medan yang Pesonanya Tak Lekang oleh Zaman. Retrieved February 1, 2018, from https://travelingyuk.com/tempat-wisata-sejarah-medan/80388/
[25] Schermerhorn, J. R. (2013). *Exploring Management*. John Wiley & Sons.
[26] Spillane, J. J. (2005). Tourism In Developing Countries: Neocolonialism or Nation Builder. *Management and Labour Studies*, 30(1), 7-37. https://doi.org/10.1057/9780230605657
[27] Suwithi, N. W., & Boham, C. E. J. (2008). *Akomodasi Perhotelan.* Jakarta: Direktorat Pembinaan Sekolah Menengah Kejuruan.
[28] Swastha, B. (2014). *Manajemen Pemasaran*. Yogyakarta: BPFE.
[29] Tse, D. K., & Wilton, P. C. (1988). Models of Consumer Satisfaction Formation: An Extension. *Journal of Marketing Research*, 25(2), 204. https://doi.org/10.2307/3172652

The Use of Telemedicine Services to Improve the Quality of Medical Care in Russia

Natalia L. BORSCHEVA [1*], Yulia V. FEDOROVA [2], Natalia V. MITYAEVA [3*], Elena Z. GERCHIKOVA [4], Egor A. FEDOROV [5]

[1] First Moscow State Medical University I.M. Sechenov, Moscow, Russia; E-mail: borscheva_nl@mail.ru
[2] First Moscow State Medical University I.M. Sechenov, Moscow, Russia; E-mail: praskovia68@ya.ru
[3] Saratov Socio-Economic Institute of Plekhanov Russian University of Economics, Saratov, Russia; E-mail: kafedra_oet@ssea.runnet.ru
[4] Saratov Socio-Economic Institute of Plekhanov Russian University of Economics, Saratov, Russia; E-mail: kafedra_oet@ssea.runnet.ru
[5] First Moscow State Medical University I.M. Sechenov, Moscow, Russia; E-mail: gravi888@yandex.ru
[*] Corresponding author

Abstract

The article discusses the application of information technology in medicine without which it is impossible to increase the effectiveness of medical care for the population of Russia. The development of telemedicine in Russia is associated with great difficulties due to differences in the level of information transfer between regions, and an inadequate network of nationwide and mutually certified medical diagnostic systems, so we used the best management experience in Russia and abroad and offer some solutions for our country. Language and cultural barriers are an unavoidable problem in cross-border medical treatment. This study makes several suggestions for addressing linguistic and cultural barriers in cross-border telemedicine from a management point of view. As an example of the application of information technology in medicine in the study, a system for managing telemedicine services was developed and implemented by the example of remote medical examinations in a private medical clinic and the effectiveness of the implementation of this system was determined.

Keywords: *telemedicine; information technology; healthcare; quality of medical services.*

1. Introduction

In the Russian Federation, modern information technologies, including medicine, are rapidly being introduced into all spheres of human life. First of all, advanced innovations are introduced in healthcare in order to create a unified medical information space, through which the efficiency of providing medical care to the population will increase, which will undoubtedly affect the provision of a qualitatively new socio-economic level of development of the country.

It is impossible to talk about the modern provision of organizational and technological processes at the level of medical institutions to provide affordable and high-quality medical care to the population without the introduction of information technologies in healthcare. Depending on the priority of national tasks in the field of health, the state policy on Informatization of the industry, as well as the possibilities of financial and technical support for the introduction of information technologies, different countries solve these issues differently.

The method of introducing patients and monitoring their condition that has been developing over the years is no longer relevant and delays the development of the entire health care system as a whole. In Russian medical organizations of the state health system, for example, less than 15 minutes are allocated for the examination of one patient. The doctor must have time to make an examination of the patient, determine his diagnosis, prescribe treatment and make appropriate entries in the medical documentation and in the patient's card. It is clear that this time is not enough for full-fledged patient care. Also, in the reception departments of the hospital, registries of the polyclinic level, there is a decrease in the efficiency of servicing applicants due to the time-consuming work with medical documents. On the other hand, modern domestic medical organizations have huge amounts of information in their assets. The quality of medical care provided, and therefore the standard of living of citizens in the country, directly depends on the degree of effectiveness of the use of data by all parts of the health sector.

According to BCC Research and IPS Technology, the market for telemedicine services in the world is growing by 18-21% every year and will reach 40-55 billion Dollars per year in the next 3-5 years . The growth of the telemedicine services market is supported by an explosive growth in the number of users – up to 7 million people in 2018 against 350 thousand in 2013 (according to the IHS Technology report) [1].

1.1. Purpose of research

The purpose of the study was to identify problems associated with the use of telemedicine services and implement a system for managing telemedicine services in a private medical company to provide quality medical examinations to any patient, regardless of their location.

1.2. Research problem

To achieve this goal the following tasks were solved:
1) the current state of telemedicine in Russia is analyzed;
2) the development of telemedicine in different countries is considered;
3) identified the main Risks and expectations from the introduction of telemedicine services;
4) features of the use of information technologies in the provision of medical care have been identified;
5) telemedicine services management system has been developed and implemented for remote medical examinations in a private medical clinic.

2. Materials and methods of research

Russia has a vast territory, with a particularly low level of medical care in vast rural areas and remote areas. Telemedicine is more necessary for development, but it is still limited by the level of technology, laws, and awareness. In order to monitor critically ill patients, most early-age hospitals used the television monitoring method, which is the initial form of telemedicine. The development of computer and communication technologies, especially the development of the Internet, has provided a technological platform for remote diagnostics, remote treatment, and remote surgery.

As a result, telemedicine in the modern sense was proposed as a new applied technology, and it quickly attracted widespread attention. The development of telecommunications technologies has had a huge impact on the reform of the healthcare industry. Recent technological developments have provided new solutions to the various problems currently facing the health promotion system. However, until now, telemedicine has only been used as part of the solution to many business problems. Telemedicine uses information processing and telecommunications technologies to transmit medical information in the form of audio-visual, graphic, or other forms for diagnosis, treatment, research, and training.

Russia covers the continents of Europe and Asia, with an area of 17,098 million square kilometers. It is the largest country in the world. And the population of Russia is 148.5 million people. Given its vast territory, the Russian Federation is a sparsely populated country with an average population density of less than 9 people per square kilometer. Thus, the regional distribution of the population is highly uneven, and the population density varies greatly from region to region, its European population is densely populated, and the population living here is more than half of the total population. Part of Asia is sparsely populated, with an average of 3.5 people per square kilometer, of which Siberia has only one person per square kilometer, and the area with the smallest population is the cold zone along the Arctic ocean, with an average of 0.1 to 0.3 people per square kilometer.

Currently, the problem of shortage of medicines and medicines in remote areas of Russia is very serious. Due to cultural factors and other problems in Asia that cannot meet the requirements of updating knowledge, it is difficult to attract high-level medical staff and difficult to raise the level of local medical staff, as a result, patients in these areas cannot receive timely treatment, and some conditions require long distances. In these conditions, a trip to the metropolis for medical care is also a serious economic cost. The advent of telemedicine makes it possible to get rid of this problem.

Here are the main advantages of telemedicine in comparison with "face-to-face" medical services:

1. The ability to provide patients in remote areas with equal medical treatment, reduce the differences caused by regional differences and uneven distribution of medical resources, so that patients in remote areas do not have to travel long distances when necessary, and they can receive timely diagnosis and treatment from experts.
2. Telemedicine can provide timely diagnosis and treatment, especially by reducing the time for diagnosis and treatment of accidental injuries, and plays an important role in preventing the spread of epidemics.
3. Telemedicine reduces the time and cost of consultations with doctors and visits to patients in hospitals through remote diagnostics and consultations, thereby reducing medical expenses, especially in special cases when some doctors are inconvenient or unavailable, for example, for the mentally ill, skin diseases. Diagnostics and treatment of patients, patients with infectious diseases, cosmonauts, polar explorers, and sailors.
4. Telemedicine can remotely monitor families with high morbidity, such as the elderly, the disabled, and patients with chronic diseases, thereby improving the quality of life of patients.
5. Remote monitoring can be performed in a familiar environment for patients, which reduces psychological pressure and increases the accuracy of diagnosis.
6. Distance education has a wide range of service facilities that can not only provide medical staff with opportunities for continuing education, improve the medical standards of medical personnel, especially in remote areas, but also provide an opportunity for ordinary patients and healthy people to obtain medical knowledge. Increase the level of health care and disease prevention for the entire population.

Telemedicine (from the Greek. tele-distance, lat. mederradiation) is a healthcare tool that uses telecommunications and electronic information (computer) technologies to provide medical care and services at the point of need (in cases where the geographical distance between the medical professional and the patient is a critical factor [2].

New medical services aimed at improving the level of diagnosis and treatment, reducing the cost of medical care and meeting the needs of the population in the field of health. Currently, telemedicine technology has evolved from the initial television monitoring and remote phone diagnostics to the use of high-speed networks for complex digital data, images and voice transmission, and has implemented real-time voice and image transmission, providing modern medical applications. A wider space of development.

Currently the following three main types of telemedicine services in Russia are considered to be specific:

Storage and forwarding services: users upload symptoms and other related information, and doctors make judgments and reviews based on the symptoms they receive. For example, if a user detects a rash on their body at home, they take a picture with their mobile phone and upload it to a special app or upload it to a remote network of dermatological health services. After a professional dermatologist makes a decision, the offers are returned to the user.

Telemedicine monitoring is a remote diagnostic and preventive medical service in which certain patient data is sent to a medical professional using electronic document management for a certain period of time for long-term monitoring of the patient's health.

Currently, most medical institutions are trying to reduce the number of hospital visits and the average length of stay in order to ensure that the hospital operates effectively. There is a huge market for providing telemedicine services to patients at home.

Patients with chronic diseases such as diabetes, hypertension, and heart disease can automatically upload their measured physical data to the cloud via a wireless network. Doctors are responsible for monitoring and analyzing data, and intervene when data fluctuates, providing professional medical treatment and care.

Virtual visit: the doctor communicates directly with the patient in text, language, or video. Among them, video is currently the

most common and effective way of communication. Patients can be made at home using various mobile devices or at telemedicine kiosks purchased by entrepreneurs and at nearby pharmacies. Usually, the doctor can make a preliminary diagnosis and give advice to the user.

2.1. The historical aspect of the development of telemedicine

Let's look at the development of medicine in different countries.

In the late 1950s, the American scientist Wittson first used two-way television systems for treatment, in the same year Jutra et al. founded teleradiology. Since then, doctors in the United States have continued to use communications and electronic technologies for medical activities, and the term "Telemedicine" has emerged.

2.1.1. First-generation telemedicine

Telemedicine activities from the early 1960s to the mid-80s were considered the first generation of telemedicine. The development of telemedicine at this stage is slow. Based on an objective analysis, information technologies were not yet sufficiently developed at that time, the information highway was at a new stage, the volume of information transmission was extremely limited, and telemedicine was limited by communication conditions. The term "telemedicine" and its derivatives – "telemedicine system", "telemedicine center" – were used to refer to remote consulting medical care. They were put into practice by scientific research by K. Bird (1971), R. Murphy, and R. Mark (1974) [3,4,5]

2.1.2. Second-generation telemedicine

Since the late 1980s, with the constant improvement of modern communication technologies, a large number of valuable projects have been launched, and their momentum and impact far surpass the first-generation technologies that can be considered as second-generation telemedicine. Based on the number of documents collected by Medline, the number of documents in telemedicine increased geometrically over the 10 years from 1988 to 1997. With the introduction of telemedicine, the United States and Western European countries developed the fastest. Communication methods mainly use satellite and integrated service data network (ISDN), remote consultations, remote consultations, long-distance transmission of medical images, remote conferences, and great advances have been made in military medicine.

In 1988, the United States proposed that the telemedicine system be an open and distributed system. In a broad sense, telemedicine should include modern information technologies, especially two-way audio-visual communication technologies, computers and remote sensing technologies for providing medical services to remote patients. Or exchange of information between doctors. At the same time, American scientists have also defined the concept of a telemedicine system as follows: a Telemedicine system refers to a whole that provides medical services to certain groups through communication and computer technology. This system includes remote diagnostics, information services, remote training and other functions, is based on computer and network communication and is based on multimedia technologies for transmitting medical data, provides the transmission, storage, query and display of video, audio and video over long distances. The educational medical system (CSAMS) is currently the world's largest and most extensive distance learning and telemedicine network that can perform wired, wireless, and satellite communications, and is part of the telemedicine network [6].

Europe and the Euro Union organized large-scale experiments to promote the telemedicine system with the participation of 3 biomedical engineering laboratories, 10 large companies, 20 pathology laboratories and 120 end users, which contributed to the popularity of telemedicine. Australia, South Africa, Japan, Hong Kong and other countries and regions also conduct various types of telemedicine events. In December 1988, a strong earthquake struck the Armenian Republic of the former Soviet Union. With the support of the us-USSR Joint working group on space physiology, NASA conducted the first international telemedicine, as a result of which a hospital in Armenia was consulted with four us hospitals. This shows that telemedicine can cross international political, cultural, social and economic borders.

3. Results and discussion

We will determine the risks from the introduction of telemedicine services and expectations. Currently the main obstacles in telemedicine:

1. Problems with data sharing. Currently, information about the patient's health status is stored in the information systems of various types of medical institutions, which are isolated from each other and are difficult to find and use effectively.
2. Privacy protection issues: patients ' medical data has a high level of privacy protection. Currently, third parties can store patient data. If mismanaged, this can lead to leakage and misuse of patient data.
3. Problems with the quality of the equipment. The quality and calibration of mobile blood glucose and sphygmomanometers can lead to misleading and misdiagnosed risks due to inaccurate results: due to factors such as network bandwidth, the clarity of downloaded data for remote mobile consultations is currently not high enough. There are also some obstacles to video communication.

One of the most important conditions for the development of the entire healthcare sector in General is the introduction of information technologies to improve the quality and effectiveness of interaction between all participants in the industry: medical professionals, including heads of medical organizations, and patients.

Information technology is a powerful resource that can mobilize medical science and practice, Federal and regional clinics, various specialties, technologies and innovations.

The application of information technologies in health care can greatly improve the efficiency and quality of medical care through the implementation of electronic services for citizens quickly access the physician for the necessary documentation of the patient in other medical organizations, and for eliminating paper records and medical staff and finally by ensuring the continuity of treatment, regardless of – which health organization called patient.

In 2014, the first stage of "basic Informatization" of a large-scale project to introduce a Unified state information system in the health sector, which launched infrastructure transformations in the industry, was completed in Russian healthcare. Telecommunications and computer equipment were installed in more than 7 thousand medical institutions, a unified secure network for transmitting medical data was formed that United all regions of Russia, and Federal components of a Unified system were developed.

By January 1, 2019, medical organizations in 81 constituent entities of the Russian Federation had implemented medical information systems with automated work places of doctors connected to them (which is 57% of the required number). 83 subjects of the Russian Federation have organized an electronic doctor's appointment for citizens. 66 regions have implemented a unified regional dispatching system for the ambulance service [7].

Since 2012, medical organizations in the Russian Federation have been systematically implementing information technologies based on the use of medical information systems that are able to maintain electronic medical records, in which the doctor has access to all information about the patient, his appeals and research results, ensuring interdepartmental interaction in order to provide citizens with electronic services [8]. A number of hospitals and clinics have introduced electronic disability lists, which ensures guaranteed delivery for employers without re-registration and errors.

State information systems in the health sector of the country's subjects provide centralized support for regional health care processes, including managing doctor appointment schedules, monitoring medical care for individual profiles, optimizing the work of emergency medical services, providing the population with preferential medication, consulting with the use of telemedicine technologies, and creating archives of medical images.

For example, the following electronic services are available to citizens in the patient's personal account "My health" on the Unified portal of state services in Russia and abroad:

1) make an appointment with a doctor;
2) getting information about being attached to a medical organization;
3) getting information about the MHI policy and medical insurance organization;
4) possibility to apply for a choice of insurance medical organization;
5) getting information about medical services rendered and their cost. In the future, existing services should be supplemented with the ability to record for preventive medical examinations and medical examinations, access to their electronic medical documents.

In 2018, more than 3.7 million citizens used the services and services of the patient's personal account "My health" on the Unified portal of state services and functions. In the context of "digital inequality" in sparsely populated and remote areas, the introduction of information technologies is still, unfortunately, lagging behind. A large number of medical organizations need to connect to the Internet or need to upgrade communication channels.

In 2017-2018, hospitals and clinics were connected to the Internet in accordance with sub-item "a" of item 4 of the list of Instructions of the President of the Russian Federation dated December 5, 2017, no.PR-2346 [9]. By the end of 2018, more than 9,000 structural divisions of medical organizations at the state and municipal levels of health care were provided with access to the Internet at the expense of the Federal budget.

In addition, measures are being actively taken to introduce a targeted model of information interaction between medical organizations and territorial institutions of medical and social expertise in terms of transferring referrals for medical and social expertise in the form of an electronic document. After testing of the specified target model of information interaction, its scaling will be provided in all regions of Russia.

As an example of the use of information technologies in medicine in this study, a system for managing telemedicine services was developed and implemented in a private medical clinic of Medholding LLC using remote medical examinations as an example. 2116 medical examinations were conducted, and 18 doctors of different specialties were involved.

As a result of implementing a system for managing telemedicine services on the example of remote medical examinations:

1) the productivity of medical personnel increased by 7%;
2) the cost of medical examinations decreased by 12%;
3) the number of patient complaints decreased by 84%;
4) the profitability of the clinic's activities in this area has increased by 4%.

4. Conclusion

Thus, expanding the use of modern information technologies in the provision of medical care is one of the key areas for optimizing the Russian system of medical services and improving their quality.

It is crucial that the use of the latest telemedicine technologies can significantly improve the quality of diagnostics and monitoring of citizens ' health, while working to prevent diseases and improve the quality of life.

Information technologies in the field of health care should solve two main problems-overcoming distances and reducing routine processes.

The latest trends in medicine are primarily a personalized approach to the patient. Thus, the use of information technologies will allow the patient not only to receive digital services in the field of medicine for the most popular life situations (appointment, medical examination, vaccination, providing access to personal electronic medical documents, obtaining an electronic medical policy and other useful services), but also to solve the following issues:

- individual selection of individual drug therapy taking into account the blood group, medications used, previous prescribed therapy, results of laboratory diagnostic studies, interaction with other drugs, allergological history, chronic diseases, compatibility with treatment received by the patient in connection with other diseases, profession, and so on;
- monitoring of the patient's medication use, dosage and frequency with the use of new mobile and remote technologies;
- reduction of visits by citizens to medical organizations to receive social support measures, including by citizens with disabilities to establish disability.

Modern information technologies will allow the doctor to:

- to minimize the routine activities associated with maintaining medical records;
- apply technologies of medical decision-making systems;
- provide verification of histological studies through artificial intelligence image processing systems;
- enter data about the patient not by manual input, but by means of speech processing with automatic entry into the electronic medical record of the patient;
- respond to deviations in the indicators of patients who are under remote dispensary supervision;
- conduct remote consultations with doctors of narrow specialties from regional and Federal centers;
- determine the need for hospitalization of a patient based on electronic medical documents;
- apply technologies for automated support of differential diagnosis of diseases;
- to conduct standard operations with the use of robotics;
- receive distance medical education.

For medicine as a science, the use of information technologies will allow us to use "big data" technologies, develop medicines, search for new treatment methods, process large amounts of data, and conduct relationships with other areas of knowledge.

For health authorities information technologies will allow:

- to make management decisions in the planning of admission of patients, management of patient flows;
- to optimize the cost of sanitary aviation;
- plan the flow of patients receiving high-tech medical care;
- plan the purchase of medicines;
- automate hospital and management processes;

- ❑ to provide electronic interdepartmental interaction;
- ❑ reduce the burden on medical staff;
- ❑ apply the capabilities of robotic technologies in the preparation of medicines.

References

[1] https://www.bccresearch.com/partners/tbrc-market-briefs/telemedicine-technologies-global-market-opportunities-and-strategies.html
[2] Vladzimirsky A.V. (2011). *Telemedicine: a monograph*. Donetsk: Knowledge. 436 pp.
[3] Levanov V. M. (2012). From telemedicine to e-health: evolution of terms / / Health Organization and public health. *Medical almanac*, no. 2, p. 16-18.
[4] Gribunov Yu. L. (2006). *Morphological and organizational aspects of telemedicine use* M. 86 p.
[5] Huang H. (1996). Teleradiology technologies and some service models. *Computerized Medical Imaging and Graphics*. No. 20 (2) pp. 59-68.
[6] https://cme.csam-asam.org/
[7] On requirements for medical information systems. Electronic resource. https://www.kmis.ru/blog/o-trebovaniiakh-k-meditsinskim-informatsionnym-sistemam
[8] State program of the Russian Federation "development of healthcare". Electronic resource. https://www.rosminzdrav.ru/ministry/programms/health/info
[9] List of instructions for implementing the President's Address to the Federal Assembly. Electronic resource. http://www.kremlin.ru/acts/assignments/orders/53425

SMEs Project Management in African Context: Moroccan Quantitative Approach

Amina OUKENNOU[1*], Mohamed EL OUMAMI[2], Zitouni BEIDOURI[3], Otmane BOUKSOUR[4]

[1]Higher National School of Electricity and Mechanics (ENSEM), Hassan II University of Casablanca, B.P. 2693 Maarif, Casablanca, Morocco; E-mail: amina.oukennou@gmail.com
[2,3,4]Laboratory of Mechanics, Production and Industrial Engineering (LMPGI), Higher School of Technology of Casablanca (ESTC), University Hassan II of Casablanca, Morocco
[*]Corresponding author

Abstract

Project management becomes a key instrument and a strategic factor impacting all types of enterprises including the SMEs. Small to Medium-sized enterprises (SMEs) are a very important component of the economy. They contribute strongly in all the industries all over the world. They are considered as the engine for future growth in the economy. Application of project management in this type of enterprises fostered a forum of discussions.
This paper will focus on the Moroccan SMEs. By employing quantitative mode of enquiry, we will attempt to discover several aspects of projects and project management in Moroccan SMEs. There are five primary aims of this study 1-To light on the correlation between enterprises characteristics especially age, size and projects. 2-To investigate the level of using project management. 3-To discover the tools and techniques used by Moroccan SMEs. 4-To define the success and failure factors for the projects in Moroccan SMEs.5-And finally to describe the project management methodology required by Moroccan SMEs.
50 enterprises, from different sizes and industries, filled a web-based questionnaire. Moroccan enterprises age and size strongly impacts projects characteristics. Projects are more important in younger companies. The percentage of enterprises using project management as an official process is correlated with the size of the enterprise. The large enterprises use formal techniques while the small companies use informal ones. The top management gives more support to projects when the structure is bigger. The most used techniques are requirement management, project roadmap and milestone schedule. Excel and the messaging are the tools the most used for the whole enterprises. As for success and failure factors: all the enterprises think that cost and time management, Stakeholders coordination and top management support are the most important parameters. As for the required methodology of project management, the most important element for all the enterprises is time management.

Keywords: *project management; SMEs; Morocco; Africa; quantitative; turnover.*

1. Introduction

The Small to Medium-sized enterprise (SME) is a complex concept (Zinovieva et al., 2016) with different definitions (McAdam et al., 2017). Many criteria are used to define an SME. It can be the staff count or the annual turnover or both of them (Garg et al., 2010). In Morocco, an SME is defined as an enterprise with a permanent staff count fewer than 200 persons and having achieved over the last two years, a turnover not exceeding 75 million Moroccan dirhams (Bulletin officiel Maroc, 2002). The General Confederation of Enterprises of Morocco" La CGEM (CGEM, 2018) made an SME classification as described below:

- The self-entrepreneur: less than 500,000.00 MAD (The Moroccan Dirham), for commercial, industrial and craft activities and less than 200,000.00 MAD, for services;
- The very small enterprise "La TPE: Turnover≤10 MDHS;
- SME (Small and Medium Enterprise)" La PME: 10 ≤ Turnover ≤ 200 MDHS;
- GE (large companies) La GE: Turnover > 200 MDHS;
- These enterprises represent around 90% of the industrial companies. They contribute up to 40% of the Moroccan industrial turn over and employ more than 50% of the workforce (CAISSE CENTRALE DE GARANTIE, 2009). They also represent 99 per cent of all businesses in developed economies, with around half of all employment and turnover (Anderson and Ullah, 2014). In 2005, in European Union more than half of the employees were working for the enterprises with a staff count less than 50 (Forsman and Rantanen, 2011).

These statistics and many articles of research (Antony et al., 2005; CUMENAL, 2015; Pollack and Adler, 2014) prove the importance of the SMEs. They were considered as the catalyst of the future economy (Forsman, 2008), vital and significant contributor to economic development, job creation, and the general health and welfare of economies (Morrison et al., 2003).

On the other hand, project management became one of the strongest used tools (Morris, 2010). Its use has increased greatly in recent years (Meister, Walter, 2006). Thanks to many international studies, It has demonstrated that well used project management practices have positive effects on projects (Meister, Walter, 2006; Rwelamila and Purushottam, 2012; Thomas, 2008; Wells, 2012). Applying practices for SMEs leads to the achievement of their organizational objectives and

increases their productivity (Pollack and Adler, 2014).Besides to that, one of the reasons for product development delays is poor project management (Owens, 2007).

Unfortunately, many of project management practices were considered complex especially for SMEs (Meister, Walter, 2006), (Ganesh and Mehta, 2010; Lazim and Azizan, 2010; O'Sheedy et al., 2010). This pushed SMEs to manage projects relying on informal procedures (DSI_CIGREF, 2009; Meister, Walter, 2006). To resolve this contradiction, researchers emphasize the importance of focusing on project management required by SMEs (J. Rodney Turner et al., 2009).

While many researchers insisted on large enterprises project management and did little studies about SMEs project managing (Kim and Vonortas, 2014; Turner et al., 2012), (Turner et al., 2012), some researchers tried to fill in the gap and did concentrated studies about small companies [6], [24]. One of them is Rodney Turner who tried to describe the project management required by SMEs in a detailed way (J. Rodney Turner et al., 2009; Payne and Turner, 1999; Turner, 2018; Turner et al., 2012, 2010).

In our study, we were inspired from Turner study and decided to combine the quantitative and qualitative approaches, researcher and practitioner (Walker et al., 2008) in order to discover Moroccan SME. Our primary aim is:

1. To determine the extent to using projects in Moroccan SMEs;
2. To identify the characteristics of the project management used in the Moroccan SMEs;
3. To discover the tools and technics used by Moroccan SMEs;
4. To define the success and failure factors for the projects in Moroccan SMEs;
5. To describe the project management methodology required by Moroccan SMEs.

The paper is structured as follows. First, the literature on SMEs characteristics and project management will be reviewed. Following this, the methodology will be presented (data collection and tools). The results will be discussed with the aim of answering the proposed research questions. The last section contains the conclusions of the study.

2. Literature Review

2.1. SMEs characteristics

SMEs as a distinct type of enterprises has many special characteristics, advantages and disadvantages (Murphy and Ledwith, 2007). Researchers proved that they are different from large firms (Anderson and Ullah, 2014). They have generally a potential of flexibility and closeness to the customer (Audretsch et al., 1999). They have effective and open communication channels, low resistance to change and people orientation company-wide awareness [35], [36]. They are also unfettered by bureaucracy and hierarchical thinking (Liao and Welsch, 2003).

In an other hand, SMEs suffer from many problems: lack of material and technological resources (Murphy and Ledwith, 2007), limited resources, limited finance and managerial expertise (Anderson and Ullah, 2014), the lack of information to analyze the market, with little capital and less technology (Suliantoro et al., 2019).

Antony and all made a recapitulation of the SMEs strengths and weaknesses (Antony et al., 2008). The table is a summary of this comparison.

SMEs strengths	*SMEs weaknesses*
Flexible and hence change can be introduced quickly	Low degree of standardization and formalization
Flat with few layers of management and fewer departmental interfaces	Focus is on operational matters rather than planning
Top management highly visible and hence provide leadership by example	There are chances that management lay off employees when the work becomes superfluous
Absence of bureaucracy in management teams	Limited investment in IT
Tend to have high employee loyalty	No incentive or reward programs in many cases due to budget and resources constraints
Managers and operatives are more likely to be directly involved with the customers	Lack of strategic planning and inspiring vision
Rapid execution and implementation of decisions	Responsible for many facets of the business and many decisions. Decisions are generally made for short-term profitability
Training likely to be focused	Lack of skills, time and resources; no specified training budget
Culture of learning and change rather than control	Incidence of 'gut feeling' decisions more prevalent; often operate in a fire-fighting mode for survival
People oriented	Not systems oriented
More responsive to market needs and more innovative in their ability to meet customers' demand	Extent of training and staff development in SMEs is limited and informal
Likely to deploy improvements quickly and gain rapid benefits	Adamant and dictatorial nature of owner can damage new initiatives
Loose and informal working relationships and absence of standardization	Formation of strategy process is intuitive rather than analytical

Table 2.1. SMEs strengths and weaknesses

2.2. Projects and project management

The Project Management Institute defines the project as: "A temporary endeavor undertaken to create a unique product, service, or result" (Institute, 2013) and the project management as: "the application of knowledge, skills, tools and techniques to project activities to meet the project requirements" (Institute, 2013).

Due to its importance, this discipline was approached by many organisms: IPMA International Project Management Association (IPMA, n.d.), the International Organization for Standardization ("International Organization for Standardization," n.d.) and more others.

It has demonstrated that project management has many advantages for all the enterprises especially SMEs: linking project objectives to strategic goals and increasing the communication across the organization (Sousa et al., 2018), impacting positively the performance of SMEs (Turner and Ledwith, 2018).

2.3. SMEs project management

Because of the lack of studies focused on SMEs, some researchers recommended detailed studies about SMEs (Zach et al., 2014). Many studied the subject component by component: communication management (Ahuja et al., 2010), stakeholder management (Albats et al., 2019), performance (Belhadi et al., 2018), risk management (Oláh et al., 2019) and knowledge management (Cahyadi, 2019; Gil-Pechuán et al., 2013).

Others compared SMEs characteristics to the large organizations (Ghobadian and Gallear, 1997)). They found that SMEs require simple and informal processes with multi-tasking (Ghobadian and Gallear, 1997). That they have limited use of project management techniques and were not benefiting from project management in terms of increased new product success (Murphy and Ledwith, 2007).

Turner and al studied SMEs for a long period. One of their studies was spread over 3 stages:

❑ **The first phase:** They conduct an investigation about project management in Irish SMEs (J. Rodney Turner et al., 2009).

It was based on a questionnaire destined to Irish companies.

The objective of the study was to measure the level of use of projects in small firms, the resources they employ, how they measure the success of projects, and the tools and techniques they use. Results indicate that all enterprises of any size spend an average of one third of their turnover on projects. That the smaller the company is, the smaller the projects are, less it uses project management and its tools. The study also concluded that SMEs need "lite" versions of project management, with simplified tools. Different versions may also be required for different industries. This means for a practitioner to choose the project management process implemented according to the size of the project and the sector from which it comes (J. Rodney Turner et al., 2009).

❑ **The second phase:** They interviewed 18 companies from Ireland, Sweden, Austria and Romania (Turner et al., 2010).

This study was conducted on 18 companies from Ireland, Sweden, Austria and Romania. Its purpose was to identify the nature of project management required by SMEs (micro, small and medium enterprises) from various sectors. Results indicate that the main differences between SME project management approaches are the size of the firm and the country.

The researchers came up with results for all three types of businesses. Small and micro enterprises have a preference for more person-centered project management approaches in the sense of working in a family. Employees are multi-tasking, with a principle of laissez-faire on the part of top management. Medium-sized companies rely on specialists and their work requires much more formal coordination. In this case, it is the most autocratic management approaches that are most favored.

By comparing the four countries, the researchers noted that employees in South-East European countries seem willing to follow pre-established plans by others in an autocratic management style. The people of the countries of North-West Europe want to be part of the planning process and therefore to be more in a more democratic management style, or even laissez-faire. The Swedish employees recognize the need for coordination and are willing to adhere to established plans, even if they wish to participate in their development. The Irish are the participants who showed a reluctance towards management control.

Turner's study concludes that micro and small businesses need a "very light" version of project management to support the work of small project teams, with a preference for laissez-faire management styles. Medium-sized companies, on the other hand, need a "lighter" version, which is always less bureaucratic than for large companies, but more able to coordinate the work of specialists.

Turner et al believe that all these lighter versions of project management must:

- Have "requirement management" as the main component;
- Be simple to use;
- Clearly show the interest of project management to convince those who doubt, especially the top management, who must be convinced (Turner et al., 2010).

❑ **The third phase:** Turner et all used a web-based questionnaire to undertake a quantitative study of a large range of countries (Turner et al., 2012).

Based on the results of the previous two stages of their research, the authors formulated three hypotheses concerning the use of project management in SMEs, which they test using a web-based questionnaire. The questionnaire has been distributed in Ireland, the United Kingdom and Australia. He has also been sent to professional contacts in Europe and the Far East.

They received 123 responses: 57 from Ireland, 27 from Great Britain, 6 from the rest of Europe, 31 from Australia and 5 from the Far East. The authors suggested three hypothesis, they verified:

- *Use of projects in SMEs*
  SMEs use a lot of projects. The younger companies are the least likely to use dedicated project managers, which means that during this very critical period of their existence, microenterprises have projects run by amateurs. These project managers will need simplified, people-oriented forms of project management.
- *Use of project management*
  Project management is widely used for internal and external projects. Smaller, younger firms tend to use less formal project management processes than larger ones. Micro and small enterprises need less bureaucratic forms of project management to facilitate their work. Medium and large companies need more formal project approaches to coordinate the work of teams of specialists. But medium-sized companies need simpler forms of project management than large companies.
- *Practices adopted*
  Among the most commonly used project management tools for SMEs, researchers have found that requirement management is the most important practice. The next two most important practices are the use of milestones and the work schedule or milestones.
  The project management procedures used by all SMEs also include reports on the status of costs and deadlines, risk and problem management, and the work breakdown structure. Those used by small and micro enterprises are based on team building, where tasks are shared. Those used by medium and large enterprises use responsibility attribution matrices, in which the tasks are assigned to specialists (Turner et al., 2012).

As project management characteristics can change depending the country or the culture (Bredillet et al., 2010) and history (Petrovskaya et al., 2017). We adopted an equivalent approach in the Moroccan context.

3. Material and methods

The methodological approach taken in our whole study is a mixed methodology based on qualitative and quantitative approaches. We started with a literature review included Turner studies. Then we performed a qualitative study. We interviewed 18 Moroccan companies. The results of this study were combined with the literature review to formulate propositions. By a quantitative approach we conducted a web based survey to assess our propositions. We analyzed the data from 50 companies.

The results presented in this paper concern the quantitative study.

3.1. Questionnaire

The questionnaire is divided to five parts:

Part 1: Enterprise information and project dimensions

We tried to have general information about companies. We asked about the turnover, the number of employees and the age.

To determine the project dimensions, we asked two main questions: about the percentage of turnover spent on projects and the projects duration. We added another parameter to Turner analysis: The percentage of turnover generated by projects.

We did not ask about projects types. We considered it not very important in this step. We found as a result, in a former study (Oukennou et al., 2017), that Moroccan SMEs do not use a lot internal projects as a type cited by (Turner et al., 2012). They act with projects as one general type.

Part 2: We asked about some the characteristics of the project management used in the Moroccan SMEs: The use of project management as an official process, The existence of a

dedicated entity to manage projects.

Part 3: We asked about the tools and technics used by Moroccan SMEs to manage their projects.

Part 4: We asked about the most important success and failure factors for the projects in Moroccan SMEs.

Part 5: finally we asked people to describe the project management methodology required by Moroccan SMEs.

3.2. Analysis Tools

3.2.1. Statistical method

We have non-parametric data, therefore we used Spearman's rank order correlation coefficient to measure the relationships for some variables and descriptive statistics in others. We used SPSS Statistics tool.

3.2.2. SPSS Tool

The IBM SPSS® is a software platform. It offers advanced statistical analysis, a vast library of machine-learning algorithms and text analysis (International Business Machines Corporation (IBM), 2018) It was produced by SPSS Inc. and then acquired by IBM in 2009. The software name originally stood for Statistical Package for the Social Sciences (SPSS), reflecting the original market, although the software is now popular in other fields as well, including the health sciences and marketing (Wikipedia and Wikipedia,The Free Encyclopedia, 2018).

4. Results and discussion

4.1. Companies Samples

To distribute the form, we used mailing lists and we contacted people directly. We do not have the exact number of Moroccan SMEs so we cannot calculate the response rate. We had 50 enterprise replies. The Table 4.1.1 presents a summary of these enterprises. We classified enterprises by turnover (as defined in the introduction).

Table 4.1.1. Enterprises by size

Size	Number	Percentage
AE	4	8%
TPE	12	24%
PME	9	18%
GE	25	50%

Table 4.1.2 shows the repartition of enterprises by age and size (the size is based on turnover). We have more responses from older companies. It can be due to that when an enterprise is older, she gets bigger with more staff and so the probability to have one contact inside become easier.

ESize/EAge	*2-3 years*	*3-5 years*	*5-10 years*	*> 10 years*	Total
AE	0	0	3	1	4
TPE	1	1	3	7	12
PME	0	0	3	6	9
GE	0	2	4	19	25

Table 4.1.2. The repartition of enterprises by age and size

4.2. Project dimension

To analyze the project dimension in the Moroccan SMEs, we utilized a list of parameters inspired form Turner study (Turner et al., 2012):

- No Of Employees: Number of permanent employees in the enterprise;
- Enterprise Age: Number of years since the creation of the enterprise;
- Enterprise Turnover: The annual turnover of the enterprise in MAD;
- Project Spent: The percentage of turnover spent on projects;
- Project Duration: The projects duration mean;
- Project Turnover: The percentage of turnover generated by projects.

4.2.1. Enterprise Size

The two Moroccan definitions are based on enterprises' turnover. Table 4.2.5.2 shows a strong correlation ($rs=0.814$; $p<0.01$) between the Number Of Employees and the Enterprise Turnover. That means that higher turnover means higher number of employees. It means also that companies size can be defined either by their turnover or their permanent employees number.

4.2.2. Age Effect on the Enterprise Size

The Table 4.2.5.2 shows a positive correlation ($rs=0.302$; $p<0.01$) between the Enterprise Age and the Enterprise Turnover. The result means that the old enterprises are bigger than the youngest ones. Time is a significant factor for the enterprises expansion.

Enterprise Age parameter has a positive correlation ($rs=0.467$; $p<0.01$) with the number of employees. That means that older companies have a higher number of employees and that the young companies start their activities with a reduced number of employees.

It seems logical to have the same result for the two parameters: Enterprise Turnover and the Number Of Employees because of the strong positive correlation between them. It is clear that age is more correlated with the number of employees due to reasons:

- It is easier to increase the turnover than the number of employees: Employees are continuous charges;
- Moroccan law offers to the enterprises simple methods to increase their turnover;
- Moroccan employees prefer to join large companies than small ones.

4.2.3. Project Spent and Project Turnover vs Project Duration

There is a strong correlation ($rs=0.693$; $p<0.05$) between the Project Spent and the Project Turnover. This means that when the Enterprise spends more in projects, these projects become more beneficial.

The two parameters Project Spent and Project Turnover have respective positive correlations ($rs=0.286$; $p<0.01$) ($rs=0.339$; $p<0.01$) with the Project Duration. This indicates that the longest projects are the most expensive and the most beneficial.

4.2.4 Enterprise size effect on Project Spent, Project Turnover and Project Duration

The three project parameters: Project Spent, Project Turnover and Project Duration have no correlation with the enterprise size. This is can be due to:

- Projects have the same level of importance regardless of the size of the enterprise;
- Moroccan enterprises do not have global projects policy; all the projects decisions are made by individuals, that is why we cannot notice differences between large and small ones.

Table 4.2.4. The mean Project Spent by enterprise size

		Project Spent Mean. (%)
Enterprise Size	AE	*35*
	GE	47
	PME	50
	TPE	51

Even if there is no direct correlation between the Project Spent and the enterprise size, we can notice that generally Project Spent gets higher when the enterprise size gets smaller (Table 4.2.4).

4.2.5. Age effect on Projects Spent and Project Turnover

The Project Spent and the Enterprise Age are negatively correlated (rs=-0.284; p<0.01). That means that there is an inverse relationship between the two variables. The youngest enterprises spend more on projects.

The Project Turnover has a negative correlation with the Enterprise Age (rs=-0.476; p<0.05). This indicates that projects are more important in younger companies. They contribute higher in the enterprise turnover.

The Table 4.2.5.1 shows the turnover percentage dedicated to Project Spent by enterprise age. The youngest enterprises (less than 3 years) spend more; the oldest ones (more than 10 years) spend the smallest percentage.

The youngest enterprises (less than 3 years) spend almost their turnover on projects. Enterprises between 3 and 5 years spend 48% of their turnover on projects. The oldest enterprises (more than 10 years) spend 43%. All companies included spend 48% on average. This value in little larger than the average found by Turner. "Turner et al. (2009) showed projects account on average for one third of the turnover of SMEs in Ireland" (J. Rodney Turner et al., 2009).

	Enterprise Age (years)			
% Project Spent	*2 <= ... < 3*	*3 <= ... < 5*	*5 <= ... < 10*	*> 10*
	100	87	45	43

Table 4.2.5.1.
The turnover percentage dedicated to project spent

	No Of Employees	Enterprise Age	Enterprise Turnover	Project Spend	Project Duration	Project Turnover
No Of Employees	1					
Enterprise Age	.467**	1				
Enterprise Turnover	.814**	.302*	1			
Project Spend	-0.1	-.284*	0.008	1		
Project Duration	0.218	-0.015	0.217	.286*	1	
Project Turnover	-0.209	-.476**	-0.097	.693**	.339*	1
* *Significant correlation at the 0.01 level (two-tailed) * Significant correlation at the 0.05 level (two-tailed)						

Table 4.2.5.2. The repartition of enterprises by age and size

4.2.6. Partial conclusion

To analyze the projects situation in the Moroccan SMEs, we utilized a list of parameters: The number of employees, the enterprise age, the enterprise turnover, the project spent, the project duration and the project turnover. We found that:

- In Moroccan context, companies size can be defined either by their turnover or their permanent employees number because of the strong correlation between the two parameters;
- Enterprise age is a significant factor for the enterprises expansion: The older companies have a higher number of project team members whereas the young companies carry out projects with reduced number of employees;
- As for project spending, the youngest enterprises spend more than the oldest ones. Indeed, enterprises between 3 and 5 years spend 48% of their turnover on projects. The oldest enterprises (more than 10 years) spend 43%. All companies included spend 48% on average;
- As to project turnover contribution, Projects are more important in younger companies. They contribute higher in the enterprise turnover. This can explain why the small enterprises spend more in projects;
- Concerning the projects duration, Generally the longest projects are the most expensive and the most beneficial;
- The only absent correlation was between project spending, project turnover and project duration on one hand and enterprise size on the other hand. This is can be due to:
  - Projects have the same level of importance regardless of the size of the enterprise;
  - Moroccan enterprises do not have global projects policy, all the projects decisions are made by individuals, that is why we cannot notice differences between large and small ones.

4.3. Project management dimension

To analyze the project management dimension, we used three variables: General project management use, Use of Project Management as an official process and the Position of the Top Management of Project Management.

4.3.1. General use of project management

Our first question was if the enterprises use project management. All the enterprises claimed to use project management. The difference between enterprises is in defining project management.

4.3.2. Use of project management as an official process

Enterprise Size/Existence of an official process	Yes	No
AE	50%	50%
TPE	25%	75%
PME	56%	44%
GE	64%	36%

Table 4.3.2.
The Existence of an official process by enterprise size

Except AE, we remark that the percentage of enterprises using project management as an official process is correlated with the size of the enterprise. While just 25% of the TPE use it, 56% of PME do that and 64% large enterprise do too. The result mean that the use of formal project management is restricted to the PME and GE. This is correlated with the idea that small companies use informal project management (Anderson and Ullah, 2014).

4.3.3. The position of the top management of project management

Enterprise Size/Top management support	Yes	No
AE	75.00%	25.00%
TPE	58.30%	41.70%
PME	77.80%	22.20%
GE	84.00%	16.00%

*Table 4.3.3.*Top management support by enterprise size

Except AE, the results show that the top management gives more support to projects when the structure is bigger. We see that 84% of large companies managers are supporters, that 77% of the PMEs are supporters too whereas just 58% from TPE are that.

4.4. Tools and techniques used by Moroccan SMEs

4.4.1. Use of standards

Before asking enterprises about the tools and techniques are commonly used. We asked them if they use the well-known norms and standards. The table shows the repartition of that use.

	AE	TPE	PME	GE
No	50%	75%	44%	40%
Yes	50%	25%	56%	60%

Table 4.4.1. Use of standards

Whereas just 25% of the TPE use a standard, more than the half of the PME do that. The large companies (60%) are the biggest user of the standards. This is correlated with other studies, in a study of using Agile methodologies in SMEs, 64% of the interviewed SMEs were not aware of the agile concept (Bin-Hezam et al., 2018). This result confirms the result about the use of formal project management. The large enterprises are the most likely to use formal project management (the norms as an example). The small enterprises prefer the informal procedures where teams members have close interaction with customers and their teammates, characterized in strong personal links, short lines of communication and a sense of identity (Anderson and Ullah, 2014).

4.4.2. The most used tools and techniques

We asked people how frequently there use some techniques and tools. We classified the answers by frequency. We had three choices: frequently, moderately and rarely. The table summarizes the repartition of the answer frequently.

	AE	TPE	PME	GE
Requirement management	50%	75%	89%	80%
Project roadmap	75%	67%	78%	56%
Milestones Schedule	75%	67%	78%	72%
Milestones	75%	58%	67%	76%
Status reports – time –	50%	67%	56%	60%
Status reports – cost –	50%	58%	33%	60%
Status reports – resource usage –	50%	50%	44%	36%
Risk management	50%	42%	22%	36%
Work Breakdown Structure (WBS)	25%	50%	56%	24%
Issue management	75%	50%	44%	28%
Resources calendar	25%	67%	22%	28%
Responsibility Matrix	50%	42%	33%	52%
Team building	25%	17%	22%	12%
Agile methods	50%	42%	33%	20%
Gantt diagrams	50%	42%	56%	56%
PMO: Project Management Office	0%	17%	0%	24%
MS project	25%	42%	56%	32%
Excel	75%	92%	89%	80%
Word	25%	92%	67%	52%
Messaging	25%	75%	67%	76%

*Table 4.4.2.*The tools and techniques mostly used

The table shows that requirement management, project roadmap and milestone schedule are the most practices used for all the enterprises. The Excel and messaging are the tools the most used for the whole enterprises. If we take each type of enterprise separately, the AE and the PME prefer the project roadmap, the milestones schedule and excel. The TPE use the requirement management, Excel, word and the messaging as tools. The GE used more the requirement management, milestones schedule, excel and messaging as tools.

4.5. Success and failure factors in Moroccan SMEs projects

We asked people about the criteria the most decisive in project success and failure. For all the enterprises, the answer was about cost and time management, Stakeholders coordination top management support and requirement management. If we took each type separately, we find AE with top management support, the PME with cost and time management, the stakeholders coordination, project management, Project resources availability and good communication. The TPE consider cost and time management to be the most important whereas large companies consider requirement management and project management as the most important elements. In comparison with literature, Rodney, Ledwith, Kelly ((J. Rodney Turner et al., 2009)) and Murphy and Ledwith ((Murphy and Ledwith, 2007)) argue that the most important factors for project management success are planning, monitoring and control, customer consultation, and having clear goals and support from senior directors. These are followed by resource allocation (J. Rodney Turner et al., 2009) and defining requirements (Turner et al., 2012).

	AE	PME	TPE	GE
Cost and time management	50.00%	77.80%	58.30%	52.00%
Stakeholders coordination	50.00%	66.70%	50.00%	52.00%
Top management support	75.00%	55.60%	33.30%	52.00%
Requirement management	50.00%	55.60%	50.00%	60.00%
Good communication	50.00%	66.70%	41.70%	52.00%
Project management	50.00%	66.70%	33.30%	56.00%
Project resources availability	50.00%	66.70%	33.30%	48.00%
Technical expertise	50.00%	22.20%	25.00%	44.00%

Table 4.5.
The most important criteria in project success and failure

The common elements in our study and Rodney studies are: time management (planning), top management support (support from top management) and requirement management (defining requirement).

Juan et al (Correa et al., 2018) added to the clear definition of the project's scope and the sufficient project planning, a qualified project manager with leadership skills as the most important factors in project success.

4.6. Project management methodology required by Moroccan SMEs

	AE	TPE	PME	GE
Time management	50%	67%	67%	68%
Cost management	50%	50%	78%	56%
Quality management	50%	67%	56%	60%
Communication management	50%	67%	44%	60%
Risk management	50%	50%	56%	60%
Human resources management	50%	67%	44%	48%
Stakeholders management	50%	67%	33%	52%
Requirement management	50%	58%	22%	56%
Change management	50%	42%	22%	48%

Table 4.6. Required methodology components

If we take all the enterprises into account, we can remark that most important element is time management. If we take the enterprises separately, we can see that PME are more precise about the elements they would like to have: Cost management and time management. The smaller enterprises prefer more elements quality management, communication management, human resources management and stakeholder management. The largest enterprises prefer to have all the components. Cost and Risk management are two elements which become important when the enterprises become older. This is correlated to Payne and Turner conclusion that "better results are obtained for projects if the procedures are tailored to the size of project" (Payne and Turner, 1999).

5. Conclusion

In using projects and project management, Moroccan SMEs have many characteristics.

As for projects characteristics:

- Companies size can be defined either by their turnover or their permanent employees number because of the strong correlation between the two parameters;
- Enterprise age is a significant factor for project expansion: The older companies have a higher number of

project team members whereas the young companies carry out projects with reduced number of employees;

- ❑ As for project spending, the youngest enterprises spend more than the oldest ones. Indeed, enterprises between 3 and 5 years spend 48% of their turnover on projects. The oldest enterprises (more than 10 years) spend 43%. All companies included spend 48% on average;
- ❑ As to project turnover contribution, Projects are more important in younger companies. They contribute higher in the enterprise turnover. This can explain why the small enterprises spend more in projects;
- ❑ The only absent correlation was between project spending, project turnover and project duration on one hand and enterprise size on the other hand. This is can be due to:
  - Projects have the same level of importance regardless of the size of the enterprise;
  - Moroccan enterprises do not have global projects policy, all the projects decisions are made by individuals, that is why we cannot notice differences between large and small ones.

As for project management:

- ❑ All the enterprises affirm using project management;
- ❑ The percentage of enterprises using project management as an official process is correlated with the size of the enterprise. The large enterprises use formal techniques while the small companies use informal ones;
- ❑ The top management gives more support to projects when the structure is bigger.

As for techniques and tools:

- ❑ The large enterprises are the most likely to use formal project management (the norms as an example);
- ❑ The most used techniques are requirement management, project roadmap and milestone schedule. Excel and the messaging are the tools the most used for the whole enterprises.

As for success and failure factors:

- ❑ All the enterprises think that Cost and time management, Stakeholders coordination and top management support are the most important parameters.

As for the required methodology of project management

- ❑ The most important element for all the enterprises is time management. If we took the enterprises separately, PME are more precise about the elements they would like to have: Cost management and time management. The smaller enterprises prefer more elements quality management, communication management, human resources management and stakeholder management. The largest enterprises prefer to have all the components.

References

[1] Ahuja, V., Yang, J., Skitmore, M., Shankar, R. (2010). An empirical test of causal relationships of factors affecting ICT adoption for building project management: An Indian SME case study. *Constr. Innov.* 10, 164-180. https://doi.org/10.1108/14714171011037174

[2] Albats, E., Alexander, A., Mahdad, M., Miller, K., Post, G. (2019). Stakeholder Management in SME open innovation: interdependencies and strategic actions. *Journal of Business Research*, https://doi.org/10.1016/j.jbusres.2019.07.038

[3] Anderson, A., Ullah, F. (2014). The condition of smallness: How what it means to be small deters firms from getting bigger. *Manag. Decis.* 52. https://doi.org/10.1108/MD-10-2012-0734

[4] Antony, J., Kumar, M., Labib, A. (2008). Gearing Six Sigma into UK manufacturing SMEs: results from a pilot study. J. *Oper. Res. Soc*. 59, 482-493. https://doi.org/10.1057/palgrave.jors.2602437

[5] Antony, J., Kumar, M., Madu, C.N. (2005). Six sigma in small- and medium-sized UK manufacturing enterprises: Some empirical observations. *Int. J. Qual. Reliab. Manag*. 22, 860-874. https://doi.org/10.1108/02656710510617265

[6] Audretsch, D., Prince, Y., Thurik, A. (1999). Do small firms compete with large firms? *Atl. Econ. J*. 27, 201-209.

[7] Belhadi, A., Touriki, F., Fezazi, S. (2018). Benefits of adopting lean production on green performance of SMEs: a case study. *Prod. Plan. Control* 1-22. https://doi.org/10.1080/09537287.2018.1490971

[8] Bin-Hezam, R., Bin-Essa, A., Abubacker, N.F. (2018). Is the Agile Development Method the Way to Go for Small to Medium Enterprises (SMEs) In Saudi Arabia?, in: 2018 *21st Saudi Computer Society National Computer Conference (NCC)*, pp. 1-6. https://doi.org/10.1109/NCG.2018.8592990

[9] Bredillet, C., Yatim, F., Ruiz, P. (2010). Project management deployment: The role of cultural factors. *Int. J. Proj. Manag., European Academy of Management (EURAM 2009) Conference* 28, 183-193. https://doi.org/10.1016/j.ijproman.2009.10.007

[10] Bulletin official (Maroc) (2002). Maroc-Loi-2000-53-charte-PME.pdf.

[11] Cahyadi, I. (2019). A Combined ANP, TOPSIS and MCGP Approach to Select Knowledge Transfer Strategy: A Case Study in Indonesian SMEs ERP System Implementation. *IOP Conf. Ser. Mater. Sci. Eng*. 505, 012001. https://doi.org/10.1088/1757-899X/505/1/012001

[12] Caisse Centrale de Garantie (2009). Experience du Maroc pour promouvoir la croissance et l'innovation des PME.

[13] CGEM (2018). La Confédération Générale des Entreprises du Maroc | CGEM [WWW Document]. Confédération Générale Entrep. Maroc. URL http://www.cgem.ma (accessed 5.18.18).

[14] Correa, J., Castañeda, S., Quintero, D., Giraldo, G. (2018). Identification and Analysis of Project Management Success Factors in Information Technology SMEs. *Int. J. Inf. Technol. Proj. Manag*. 9, 73-90. https://doi.org/10.4018/IJITPM.2018100105

[15] Cumenal, D. (2015). Obsolescence of organizations: a modeling approach in System Dynamics. *Adv. Syst. Sci. Appl*. 15, 119-133.

[16] DSI_CIGREF (2009). Referentiels_de_la_DSI_CIGREF_2009.pdf.

[17] Forsman, H. (2008). Business development success in SMEs: A case study approach. *J. Small Bus. Enterp. Dev*. 15, 606-622. https://doi.org/10.1108/14626000810892382

[18] Forsman, H., Rantanen, H. (2011). Small manufacturing and service enterprises as innovators: a comparison by size. *Eur. J. Innov. Manag*. 14, 27-50.

[19] Ganesh, L., Mehta, A. (2010). Critical failure factors in enterprise resource planning implementation at Indian SMEs, *Asian Journal of Management Research* Vol., 1, No. 1, pp. 44-57.

[20] Garg, A., Goyal, D.P., Lather, A. (2010). The influence of the best practices of Information System development on software SMEs: A research scope. *IJBIS* 5, 268-290. https://doi.org/10.1504/IJBIS.2010.031930

[21] Ghobadian, A., Gallear, D. (1997). TQM and organization size. *Int. J. Oper. Prod. Manag*. 17, 121-163. https://doi.org/10.1108/01443579710158023

[22] Gil-Pechuán, I., Expósito Langa, M., Miquel, J. (2013). International entrepreneurship in SMEs: A study of influencing factors in the textile industry. *Int. Entrep. Manag. J*. 9. https://doi.org/10.1007/s11365-012-0242-3

[23] Institute, P.M. (2013). *A Guide to the Project Management Body of Knowledge: PMBOK Guide*. Project Management Institute.

[24] International Business Machines Corporation (IBM) (2018). IBM SPSS Software | IBM Analytics [WWW Document]. www.ibm.com. URL https://www.ibm.com/analytics/spss-statistics-software (accessed 7.13.18).

[25] International Organization for Standardization [WWW Document], n.d. ISO. URL http://www.iso.org/cms/render/live/en/sites/isoorg/home.html (accessed 10.4.19).

[26] IPMA, n.d. IPMA – International [WWW Document]. IPMA Int. Proj. Manag. Assoc. URL https://www.ipma.world/about-us/ipma-international/ (accessed 3.4.19).

[27] J. Rodney Turner, Ann Ledwith, John Kelly (2009). Project management in small to medium-sized enterprises: A comparison between firms by size and industry. *Int. J. Manag. Proj. Bus*. 2, 282-296. https://doi.org/10.1108/17538370910949301

[28] Kim, Y., Vonortas, N.S. (2014). Managing risk in the formative years: Evidence from young enterprises in Europe. *Technovation*,

Risk and Uncertainty Management in Technological Innovation 34, 454-465. https://doi.org/10.1016/j.technovation.2014.05.004
[29] Lazim, Y.Y., Azizan, N.A.B. (2010). The influence of human resources management practices, and government's role in the organizational performance of small businesses in Malaysia. *Asian J. Manag. Res*. 4, 266-287.
[30] Liao, J., Welsch, H. (2003). Social capital and entrepreneurial growth aspiration: a comparison of technology- and non-technology-based nascent entrepreneurs. *J. High Technol. Manag. Res*. 14, 149-170. https://doi.org/10.1016/S1047-8310(03)00009-9
[31] McAdam, R., Reid, R.S., Gibson, D.A. (2017). Innovation and organisational size in irish smes: an empirical study, in: *Promoting Innovation in New Ventures and Small- and Medium-Sized Enterprises*, Series on Technology Management. World Scientific (Europe), pp. 29-49. https://doi.org/10.1142/9781786343482_0002
[32] Meister, Walter (2006). Successful project management for small to medium enterprises (SMEs). Presented at the *PMI® Global Congress 2006 – Asia Pacific*, Bangkok, Thailand, Newtown Square, PA: Project Management Institute.
[33] Morris, P.W. (2010). Research and the future of project management. *Int. J. Manag. Proj. Bus*. 3, 139-146.
[34] Morrison, A., Breen, J., Ali, S. (2003). Small Business Growth: Intention, Ability, and Opportunity. *J. Small Bus. Manag*. 41, 417-425. https://doi.org/10.1111/1540-627X.00092
[35] Murphy, A., Ledwith, A. (2007). Project management tools and techniques in high-technology SMEs. *Manag. Res. News* 30, 153-166. https://doi.org/10.1108/01409170710722973
[36] Oláh, J., Virglerova, Z., Popp, J., Majerova, J., Kovács, S. (2019). The Assessment of Non-Financial Risk Sources of SMES in the V4 Countries and Serbia. *Sustainability* 11, 4806. https://doi.org/10.3390/su11174806
[37] O'Sheedy, D.G., Xu, J., Sankaran, S. (2010). Preliminary results of a study of agile project management techniques for an SME environment. *Int. J. Arts Sci.* 3, 278-291.
[38] Oukennou, A., Beidouri, Z., Bouksour, O. (2017). Empirical study of project management dimensions: guidelines for an adapted standard to SMEs and large enterprises in developing countries (Moroccan case). I*nt. J. Comput. Sci. Issues IJCSI* 14, 47.
[39] Owens, J.D. (2007). Why do some UK SMEs still find the implementation of a new product development process problematical? An exploratory investigation. *Manag. Decis.* 45, 235-251. https://doi.org/10.1108/00251740710727269
[40] Payne, J.H., Turner, J.R. (1999). Company-wide project management: the planning and control of programmes of projects of different type. *Int. J. Proj. Manag*. 17, 55-59.
[41] Petrovskaya, I., Zaverskiy, S., Kiseleva, E. (2017). Attitude to Entrepreneurship in Russia: Three-Dimensional Institutional Approach. *Adv. Syst. Sci. Appl.* 17, 29-43.
[42] Pollack, J., Adler, D. (2014). Does project management affect business productivity? Evidence from Australian small to medium enterprises. *Proj. Manag. J.* 45, 17-24.
[43] Rwelamila, P.D., Purushottam, N. (2012). Project Management Trilogy Challenges in Africa - Where to From Here? *Proj. Manag. J.* 43, 5-13.
[44] Sousa, P., Tereso, A., Alves, A., Gomes, L. (2018). Implementation of project management and lean production practices in a SME Portuguese innovation company. *Procedia Comput. Sci., CENTERIS 2018 – International Conference on ENTERprise Information Systems / ProjMAN 2018 – International Conference on Project MANagement / HCist 2018 – International Conference on Health and Social Care Information Systems and Technologies*, CENTERIS/ProjMAN/HCist 2018 138, 867-874. https://doi.org/10.1016/j.procs.2018.10.113
[45] Suliantoro, H., Winarno, B.A., Handayani, N.U. (2019). Analysing the Success Factors of SMEs on Public Procurement. *IOP Conf. Ser. Mater. Sci. Eng.* 598, 012097. https://doi.org/10.1088/1757-899X/598/1/012097
[46] Thomas, J. (2008). *Researching the Value of Project Management*. Project Management Institute.
[47] Turner, J.R. (2018). The management of the project-based organization: A personal reflection. *Int. J. Proj. Manag.* 36, 231-240. https://doi.org/10.1016/j.ijproman.2017.08.002
[48] Turner, R., Ledwith, A. (2018). Project Management in Small to Medium-Sized Enterprises: Fitting the Practices to the Needs of the Firm to Deliver Benefit. *J. Small Bus. Manag.* 56, 475-493. https://doi.org/10.1111/jsbm.12265
[49] Turner, R., Ledwith, A., Kelly, J. (2012). Project management in small to medium-sized enterprises: Tailoring the practices to the size of company. *Manag. Decis*. 50, 942-957. https://doi.org/10.1108/00251741211227627
[50] Turner, R., Ledwith, A., Kelly, J. (2010). Project Management in Small to Medium-Sized Enterprises: Matching Processes to the Nature of the Firm. *Int. J. Proj. Manag.* 28, 744-755. https://doi.org/10.1016/j.ijproman.2010.06.005
[51] Walker, D.H.T., Anbari, F.T., Bredillet, C., Söderlund, J., Cicmil, S., Thomas, J. (2008). Collaborative academic/practitioner research in project management: Examples and applications. *Int. J. Manag. Proj. Bus.* 1, 168-192. https://doi.org/10.1108/17538370810866313
[52] Wells, H. (2012). How effective are project management methodologies? An explorative evaluation of their benefits in practice. *Proj. Manag. J.* 43, 43-58.
[53] Wikipedia, *Wikipedia*, The Free Encyclopedia (2018). SPSS. Wikipedia.
[54] Zach, O., Munkvold, B.E., Olsen, D.H. (2014). ERP system implementation in SMEs: exploring the influences of the SME context. *Enterp. Inf. Syst.* 8, 309-335. https://doi.org/10.1080/17517575.2012.702358
[55] Zinovieva, C.G., Kuznetsova, M.V., Dorfman, T.V., Limarev, P.V., Limareva, J.A. (2016). Study of external and internal factors affecting enterprise's stability. *Adv. Syst. Sci. Appl.* 16, 62-71.

Building Word of Mouth (WOM) through Emotional Engagement: Problem Solving Satisfaction and Innovative Culture Perception as Predictors. Empirical Research on Tourism Village Visitors in the Special Region of Yogyakarta-Indonesia

Ida Bagus Nyoman UDAYANA [1], Didik SUBIYANTO [2*], PRAYEKTI [3]

[1] Associate Professor, Faculty of Economics and Business Sarjanawiyata Tamansiswa University, Yogyakarta, Indonesia
[2] Associate Professor, Faculty of Economics and Business Sarjanawiyata Tamansiswa University, Yogyakarta, Indonesia
[3] Associate Professor, Faculty of Economics and Business Sarjanawiyata Tamansiswa University, Yogyakarta, Indonesia
[*] Corresponding author; E-mail: didiks@ustjogja.ac.id

Abstract

The growth of the number of Tourism Villages in the Yogyakarta Province of Indonesia is increasing rapidly, this is the concern of researchers to provide strategic management direction. Through this research it is expected to be the basis of the Tourism Village manager in taking managerial policies. The purpose of this research is to find out the factors that can increase the role of visitors in promoting directly to the people they know. The questionnaire was distributed online to visitors in 10 Tourism Villages. Ten tourism villages were chosen randomly, then respondents were randomly chosen to fill out a questionnaire using the online method. The results of the distribution of online questionnaires were collected as many as 249 that met the requirements for hypothesis testing using the Structural Equation Model (SEM). Hypothesis test results from six hypotheses, a number of five hypotheses were accepted, and one hypothesis was rejected. Emotional Engagement as a mediating variable is accepted in mediating the effect of Innovative Culture Perception and Problem Solving Satisfaction on Word of Mouth (WOM).

Keywords: *word of mouth (WOM); emotional engagement; problem solving satisfaction; innovative culture perception.*

1. Background

The rise of tourism villages in Yogyakarta Province in terms of quantity and quality should be a concern for researchers. There has not been much research related to efforts to improve the quality of tourism villages, causing the development of tourism villages not working properly. Tourism Village managers must have sufficient competence to attract visitors. Tourism Village managers must have a strong and creative entrepreneurial spirit. The reliability and toughness of entrepreneurial spirit can be achieved if there is high competence (Robles and Zárraga-Rodríguez 2015).

Business practitioners on the scale of Small and Medium Enterprises (SMEs) involved in the rural tourism community need to build quality communication to their potential customers. Small and Medium Enterprises must be able to build customer behavior that has a large contribution in the form of promotional activities by word of mouth.

Word of mouth promotion is really made by customer satisfaction. The strength of the appeal of word of mouth promotion is related to customer satisfaction for goods or services received, this will lead to the delivery of positive messages about these products and services (Özdemira et al. 2016).

Word of mouth promotion (WOM) has been empirically proven to contribute to increasing understanding of an organization (Özdemira et al. 2016). Based on empirical evidence, business people must make maximum efforts to build Word of Mouth to all stakeholders. This strategy of utilizing WOM is very strong in attracting potential customers, because the information received by potential users comes from the user, so there is trust from the recipient of the information. Thus a strategic effort must be made to create a sense of one's involvement in the relevant organization. One of the strong psychological relationships is the establishment of social relationships in the form of delivering quality verbal information to other parties.

There is a sense of attachment to members of the organization does not necessarily appear in the individual when he entered the organization concerned, but there are driving factors. First of all, the individuals will perceive everything they receive through the sight, hearing and experience gained during interactions with the organization or institution concerned. Perceptions of everything received in the organization must be conditioned to create their attachment to the organization.

There are a number of empirical studies that prove that some of the variables that cause an increased sense of association among organizational members to their organizations, such as (Bellani et al. 2017) prove that someone who is satisfied with solving their problems, then they are very enthusiastic in promoting their organization positively towards other parties. Meanwhile according to (Nazneen et al. 2018) the sense of connection with the organization is positively influenced by the culture that exists in the organization. From the description

above, the researchers are interested in researching with promotional themes that spread by word of mouth.

2. Literature Review and Hypothesis

2.1. Innovative culture Perception (ICP), Problem Solving Satisfaction (PSS) and Emotional Engagement (EE)

Consumer satisfaction is not only caused by the quality of the product received. Consumers need fast and precise responses from product providers when facing problems, both when going to a transaction, in the transaction process, and post-transaction. Therefore, the product provider must have sensitivity to this. Product providers must practice innovative culture in order to create customer satisfaction when they need to solve problems when going to a transaction, in the transaction process, or if there are problems after a purchase.

Organizational culture, as in an organizational structure that is able to move knowledge sharing among employees (Kathiravelu et al. 2014). Whereas innovative behavior is categorized into three groups: organizational characteristics, work environment characteristics, and individual characteristics (Asurakkody and Shin 2018). Innovative behavior becomes the values that should be adopted by business organizations.

In addition to organizational structure, innovation culture is expected to increase consumer satisfaction when they get the problem solved when going to make transactions, transaction processes and post-transactions. Culture must be the values that must be instilled for all members of the organization, so that it will strengthen the relationship between product providers and product users. Product users' perceptions of innovation and their satisfaction in making transactions will certainly be built emotionally with the users of the product towards the product provider. From the description above, the following hypothesis is proposed:

H1: Innovative Culture Perception has a significant positive effect on Problem Solving Satisfaction;
H2: Problem Solving Satisfaction has a significant positive effect on Emotional Engagement;
H3: Innovative culture Perception has a significant positive effect on Emotional Engagement.

2.2. Innovative culture Perception (ICP), Problem Solving Satisfaction (PSS) and Word of Mouth (WOM)

Based on reality, marketing practices often include Word of Mouth (WOM) messages in other forms of marketing activities, usually advertising. Using a partnership-based modeling approach, Word of Mouth (WOM) shows that it functions as a source of information flow (Hua et al. 2018). WOM is another form of product promotion. WOM will be more effective, because promotions are delivered directly from parties who have received the product. However, WOM will have a very detrimental effect if it is delivered by disappointed product recipients. Based on this logic, the product provider must continue to innovate and create satisfaction with the product user. The hypothesis proposed based on the logical reasons outlined above is:

H4: Innovative Culture Perception has a significant positive effect on Word of Mouth;
H5: Problem Solving Satisfaction has a significant positive effect on Word of Mouth.

2.3. Emotional Engagement (EE) and Word of Mouth (WOM)

Emotion is the main field of affective computing, it can be defined as a variety of internal conditions. This includes feelings and aspects of cognitive, physiological, expressive, and motivational. Some researchers classify emotions based on their needs. Emotional Quotient refers to how a person is able to understand emotions, the generation of emotions to help think, understand emotions and at the same time controlling emotions to improve emotional control abilities and intellectual (Nachiappan et al. 2014).

Related to this study specifically for the Emotional Engagement variable, where visitors are expected to have high emotional involvement, which will then drive customers (Product users) will promote directly (WOM). As has been empirically proven by (Wu et al. 2018) that emotional closeness can increase promotion word of mouth (WOM). Based on logical connections and the results of previous studies, the following hypotheses are proposed:

H6: Emotional Engagement has a significant positive effect on Word of Mouth.

3. Empirical Research Model

Furthermore, from the above hypotheses the Empirical Research Model (ERM) can be described as follows:

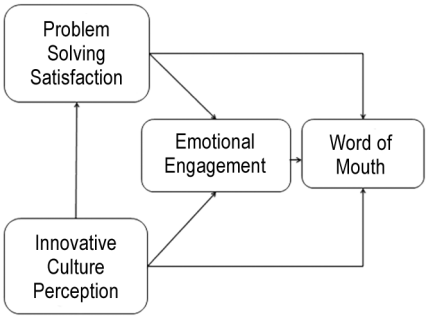


Figure 1. Empirical Research Model (ERM)

The Empirical Research Model (ERM) above illustrates the causal relationship or causality between the variables in the study. In the picture Empirical Research Model (ERM) explains that Problem Solving Satisfaction and Innovative Culture acts as an exogenous variable. While Emotional Engagement as an endogenous variable in the intervening position, with Word of Mouth as the dependent variable (outcome).

4. Research methods

This research is a quantitative study that is done by transforming the perception of visitors to the Tourism Village that is qualitative to quantitative. The stages are as follows:

4.1. Research design

This research involves several constructs that have been put forward in a hypothesis. Each construct is measured by several indicators and adjusted to the condition of the research object.

4.2. Population, Sample, and Collecting Data Method

The population in this study was all visitors in Tourism Villages in the Special Region of Yogyakarta. Questionnaires are distributed online to visitors in the Tourism Villages. Data collected online were 250 responses, then analyzed with the Structural Equation Model (SEM).

Innovation culture is measured by indicators: New products available; Unique service; Openness to new information. To measure the problem solving satisfaction measured by several indicators: Care about the problems faced by visitors; Generating ideas; Provide a solution; and Take action. Next to measure the Emotional engagement variable seen from the aspects of cognitive, physiological, and motivation. For word of mouth variables measured from several consumer actions

which include: talk about what they have experienced when visiting a Tourism Village; promoting tourism village; and recommend.

4.3. Data Quality Test

Before the regression analysis is performed, the validity, reliability, and normality tests are carried out first. The results of the analysis with the Structural Equation Model (SEM) show that all data are valid and reliable with values above 0.7.

Henceforth, so that the data can be completed in the process of data regression analysis must be normally distributed. The output of the structural equation model analysis shows normal data with univariate skewness and kurtosis is between -2.58 and 2.58.

4.4. Discussion

The results of data processing with SEM to test the proposed hypothesis, first see the value of goodness of fit of the research model. Chi-Square value is 57.588, Probability value is 0.162, CMIN value is 1.200, for TLI value is 0.989, then GFI value is 0.963, IFI value is 0.992, CFI is 0.992, and RMSEA value is 0.028. From the value of goodness of fit, it is broadly included in good criteria. However, if SEM is used, testing model fit is important and cannot be falsified (Barrett 2007).

Six hypotheses that have been proposed there is one hypothesis that was rejected and five hypotheses were accepted. In the following table is information from the results of data analysis of several proposed hypotheses which are the output of the results of regression analysis using the Structural Equation Model (SEM):

Regression			Estimate	S.E	C.R	P
PSS	←	ICP	.504	.074	6.813	***
EE	←	PSS	.301	.096	3.136	.002
EE	←	ICP	.326	.091	3.570	***
WOM	←	ICP	.304	.099	3.067	0.02
WOM	←	PSS	.057	.101	.565	.572
WOM	←	EE	.270	.094	2.890	.004

Table 1. Hypothesis Test Results

The first hypothesis which states that Innovative Cultural Perception has a significant positive effect on Problem Solving Satisfaction is evidenced by the significance value *** under 0.01. Hypothesis two (H2) which states that Problem Solving Satisfaction has a significant positive effect on Emotional Engagement is evidenced at the level of p value below 0.1. Then the third hypothesis is accepted with a p value of *** Compared to the significance value of 0.01 with an estimated value of 0.326 which is recognized that the innovative culture perception has a significant positive effect on emotional engagement. Furthermore, the hypothesis which states that the innovative culture perception has a significant positive effect on WOM is accepted with a p value of 0.002 and an estimated value of 0.304.

Hypothesis five which states that problem solving satisfaction has a significant positive effect on WOM was rejected. The p value for hypothesis five of 0.572 is above 0.05. The sixth hypothesis was empirically accepted with a p value of 0.004, and the estimated value was 0.270.

5. Conclusions and Recommendations

The results of data processing using SEM to analyze the proposed hypothesis obtained empirical evidence which can be concluded that:

Increasingly the degree of innovation culture perception practiced in the management of tourism villages will increase the problems solving satisfaction felt by visitors of Tourism Villages, and vice versa. 2) Increasing the degree of problem solving satisfaction obtained by visitors to the Tourism Village will increase the emotional engagement of visitors, and vice versa, 3) Increasing the degree of innovation culture perception by visitors to the tourism village will be able to increase emotional engagement visitors, 4) Increasing the degree of innovation culture perception by visitors to the tourism village will be able to increase word of mouth (WOM) visitors to the tourism village, and for hypothesis five (5) it is not supported empirically. This means that changes in the degree of problem solving satisfaction felt by visitors are not followed by changes in the degree of visitors' word of mouth. There is something interesting about this research with the acceptance of the sixth hypothesis (6), where the emotional engagement that exists in the visitors of the tourism village has a significant positive effect on the visitor's word of mouth. Why interesting? Because satisfaction in solving problems faced by visitors can not affect word of mouth without the emotional engagement.

In research (Standing et al. 2016) provides empirical results, that emotional connectivity can increase word of mouth. The research (Standing et al. 2016) is in line with the research we have conducted in relation to the role of emotional involvement in its role in influencing word of mouth promotion.

From this conclusion, tourism village managers need to pay attention and maintain and even improve indicators of visitor emotional engagement through improving the quality of the Innovation Culture and Indicators of Problem Solving Satisfaction that can be provided by the tourism village manager.

6. Research Limitations and Future Research Agenda

The limitation of this study is the rejection of the fifth hypothesis which states the effect of problem solving satisfaction on Word of Mouth (WOM). With the rejection of this fifth hypothesis, future research is expected to fill this research gap in addition to the emotional engagement variable.

The next drawback is the expected response target of 300, but 249 were collected. For the next study it is expected to take more samples and not only in one province.

References

[1] Asurakkody, T. A., and S. Y. Shin (2018). Innovative Behavior in Nursing Context: A Concept Analysis. *Asian Nurs Res* (*Korean Soc Nurs Sci*) 12(4): 237-244.

[2] Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences* 42(5): 815-824.

[3] Bellani, E., S. R. Ramadhani, and M. Tamar (2017). Job Satisfaction as Predictor of employee engagement. Advances in Social Science, *Education and Humanities Research (ASSEHR)* 127: 15-19.

[4] Hua, H.-h., L. Wangb, L. Jiangc, and W. Yanga (2018). Strong ties versus weak ties in word-of-mouth marketing. *BRQ Business Research Quarterly* 112: 1-12.

[5] Kathiravelu, S. R., N. N. A. Mansor, T.Ramayah, and N. Idris (2014). Why Organisational Culture Drives Knowledge Sharing? *Procedia - Social and Behavioral Sciences* 129: 119-126.

[6] Nachiappan, S., H. K. Andi, V. P. K. Veeran, A. I. Ahmad, and F. H. M. Zulkafaly (2014). Analysis of Cognition Integration in Intelligence Quotient (IQ), Emotional Quotient (EQ) and Spiritual Quotient (SQ) in Transforming Cameron Highlands Youths through Hermeneutics Pedagogy. *Procedia - Social and Behavioral Sciences* 112: 888-897.

[7] Nazneen, A., M. S. Miralam, and S. Qazi (2018). Impact of Employee Engagement and Organizational Culture in High Performing Accredited University of Saudi Arabia. International *Journal of Accounting and Financial Reporting* 8 (4): 2162-3082.

[8] Özdemira, A., E. Tozlub, E. Şenc, and H. Ateşoğlud (2016). Analyses of word-of-mouth communication and its effect on students' university preferences. *Social and Behavioral Sciences* 235: 22-35.

[9] Robles, L., and M. Zárraga-Rodríguez (2015). Key Competencies for Entrepreneurship. *Procedia Economics and Finance* 23: 828-832.
[10] Standing, C., M. Holzweber, and J. Mattsson (2016). Exploring emotional expressions in e-word-of-mouth from online communities. *Information Processing & Management* 52(5): 721-732.
[11] Wu, J., S. Fan, and J. L. Zhao (2018). Community engagement and online word of mouth: An empirical investigation. *Information & Management* 55(2): 258-270.

Perception of Protected Areas: Evidence from an Italian Alpine Area

Ivana BASSI[1], Federico NASSIVERA[2], Luca ISEPPI[3*]

[1,2,3] Department of Agricultural, Food, Environmental and Animal Sciences – University of Udine, Italy
[*] Corresponding author: Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine, Via delle Scienze, 206 – 33100 Udine, Italy; E-mail: luca.iseppi@uniud.it

Abstract

The objective of the study was to investigate perception of Alpine protected areas (APAs), which play a crucial role in protecting local natural, social and economic values. We proposed a research model in which the positive behavioral intention towards APAs was assumed to be affected by environmental awareness, awareness of wildlife, and perception of ecological connectivity and its functions. Structural equation modeling (SEM) was used to test causalities. Our findings indicated that environmental awareness is not, per se, the determinant of a positive behavioral intention towards APAs: in fact, some specific and closely interlinked elements, such as awareness of wildlife and perception of ecological connectivity, heavily affected the behavioral intention towards a responsible fruition of APAs. The managerial implications of this work include some considerations: a) perception of protected areas has to be analyzed to bolster a positive behavioral intention towards responsible fruition of protected areas; b) awareness of wildlife and perception of ecological connectivity have a crucial role and could be used to strengthen responsible fruition of protected areas; c) these aspects could act as a lever to attract tourists, investors and other stakeholders. These findings should become the basis to plan effective policies, including communication and marketing activities, aimed at bolstering responsible fruition of protected areas as well as of the Alps as a whole.

Keywords: *protected areas; wildlife; ecological connectivity; behavioral intention; SEM.*

1. Introduction and literature review

The research aimed at investigating citizens' perception and their consequent behavioral intention towards a responsible fruition of Alpine protected areas (APAs). Some premises are useful to contextualize the research, which starts from recognizing the important role of these areas for conservation, possible only through human involvement.

Protected areas are clearly defined geographical spaces, encompassing a wide variety of natural and semi-natural environments that are managed for the conservation of natural and human resources (EEA, 2017; Dudley, 2008). Although protected areas have long been the primary focus of conservation, it is now widely understood that isolated patches are not sufficient to protect individuals and communities: when habitats become too small, or their connections to other areas are cut off, species may disappear, since small, isolated populations adapt less effectively to changes in environmental conditions. Conversely, long-term ecological conservation and sustainable development rely on well-connected systems of protected areas to allow individuals and populations to move between areas as needed (Tverijonaite et al., 2018; Plassmann et al., 2016; Hannah, 2011; Hannah et al., 2007). The facilitation of ecological connectivity, through various linking elements, such as corridors, greenbelts and stepping stones, is therefore vital for biodiversity conservation (Chester and Hilty, 2010; Conrad et al., 2012; Crooks and Sanjayan, 2006; Hilty et al., 2006). Among the many species, large carnivores are particularly vulnerable to habitat fragmentation, owing to intrinsic biological traits, such as big body size, extensive area requirements, low densities and slow population growth rates, as well as to the existence of external human threats, including hunting and other forms of direct persecution (Crooks, 2002; Crooks et al., 2011). The Alps are one of the last remaining territorial expanses in Europe where species diversity is still high and largely untouched areas persist. Protected areas are spread throughout the Alpine range, and play a crucial role in conserving this broad set of values: more than 1,000 protected areas of various types (nature reserves, parks, etc.) exist in the Alps, covering about a quarter of the territory (Bartaletti, 2009; Bätzing, 2005; Belardi et al., 2011; EEA, 2012, 2017; Plassmann et al., 2016). The many possible stakeholders in natural area management are identified in numerous models (e.g., Newsome, Moore, Dowling, 2002; Burns and Haraldsdóttir, 2019). These include, but are not limited to, members of local communities, managing government authorities, and the visitors themselves. The groups are not mutually exclusive; a member of the local community, for example, may operate a tourism business and also use the region for their own recreation (Burns and Haraldsdóttir, 2019). Of particular interest in this study are the different levels of citizen's awareness of environmental peculiarities and their intentions towards a responsible fruition.

1.1. Ecological and Wildlife Awareness

Ecological understanding, knowledge sharing, and education are among the main factors that influence people's intention to engage in pro-environmental behaviors and their involvement in developing protected areas (Bauer et al., 2018; Imran et al., 2014). Effective communication strategies play a crucial role in raising environmental awareness (Mueller et al., 2018; Balzaretti and Gargiulo, 2011), for example by promoting understanding of

the vital relationship between humans and natural resources and the importance of biological diversity for life. Due to its nature as a bidirectional process, communication may also be useful for learning people's perceptions of environmental issues and so help reduce conflicts that may arise from restrictions placed on the use of natural resources in protected areas (Pearce and Dowling, 2019; Ormsby and Kaplin, 2005). The inclusion of social variables, in particular the perception of people who live in protected areas, is fundamental to ensure the success of any management model (Pelegrina-Lopez et al., 2018).

The aim of this research was to identify whether citizens' environmental awareness (EA), as a key determinant, positively affected behavioral intention towards responsible fruition of APAs, and the perceived benefits of their conservation.

An analysis might consider the environment either as a whole entity, or in terms of specific categories into which it can be divided. Among these, wildlife, and in particular large carnivores, is a hot topic, since their reintroduction and population growth has polarized public opinion. Indeed, while wildlife advocates extol the positive impacts of this phenomenon, such as the corresponding growth of wilderness tourism, opponents raise concerns about the negative repercussions that may follow for local communities living within or around protected areas or along the ecological corridors (Bradby et al., 2014; Ednarsson, 2006). For this reason, we split the construct into two different dimensions, environmental awareness and awareness of wildlife, in order to investigate the specific role each played in affecting behavioral intention towards responsible fruition of APAs.

McIntosh and Wright (2017) demonstrated that visitors' interactions with wildlife are important in creating meaningful nature experiences in protected areas. Large carnivores are often associated with wilderness, even if the European experience shows that they can survive in heavily modified and domesticated landscapes (Linnell et al., 2015). As previously mentioned, large carnivores are particularly vulnerable to habitat fragmentation and rely on ecological connectivity, albeit these species differ in the degree of fragmentation they can sustain and level of connectivity they require (Mutanga et al., 2017; Crooks et al. 2011).

The existing literature provides exhaustive analyses of human attitudes towards large carnivores (Bhatia et al., 2017; Carter and Linnell, 2016; Todd, 2002). People's concern for their personal and their family's safety is the main driver of negative attitudes towards large carnivores. Furthermore, people who are afraid of them and those who have experienced financial losses due to their proximity (i.e. farmers) tend to express negative attitudes. Instead, the excitement derived from live sightings of large carnivores in their natural environment has a positive influence on attitude towards them (Mutanga et al., 2017; Røskaft et al. 2007). With this in mind, this study proposed to consider the citizens' awareness of wildlife (WLA) as determinant of a positive behavioral intention towards responsible fruition of APAs.

1.2. Ecological connectivity

As previously observed, ecological connectivity reduces habitat fragmentation and allows species and populations to move freely (Madadi et al., 2017; Gilioli et al., 2017). From this perspective, not only natural areas but also semi-natural ones, such as agricultural landscapes, could facilitate the movement of species and increase the likelihood of natural transfers taking place to locations where conditions are more suitable for survival (Dudley, 2008). The existence of traditional agro-ecosystems is testimony to the mutual adaptation that is possible between humans and the environment at a local level, which facilitates ecological connectivity between habitats (Baiamonte et al. 2015). For this, the inclusion of ecological priorities is a strategic necessity in landscape planning. Specifically, the analysis of ecological networks is useful to infer conservation concepts and criteria that can be integrated into ordinary planning where, traditionally, human and natural systems are analyzed independently (Battisti, 2003; Scolozzi and Geneletti, 2012). Perception is the process by which organisms interpret and organize sensation to produce a meaningful experience of the world (Lindsay and Norman, 1977). In other words, a person is confronted with a situation or stimuli. That person interprets the stimuli into something meaningful to him or her based on prior experiences (Jones et al., 2018). However, what an individual interprets or perceives may be substantially different from reality. For this reason, we proposed to measure the citizens' perception of technological aspects of ecological connectivity (ECP) and its influence on behavioral intention towards a responsible fruition of APAs.

1.3. Behavioral intention towards a responsible fruition of APAs.

Acknowledging that future behavioral intention can be determined by multiple factors (Park et al., 2017), according to Fishbein and Ajzen (1975), a behavioral intention reflects a person's decision to perform the behavior. The concept is based on the idea that a decision to engage in certain behavior will only be realized to the extent that the person is in full control of the behavior. A behavioral measure is essential because of the potential gap between environmental attitudes and behavior. In line with this conceptualization, the aim of this research was to investigate the responsiveness to activities and projects on responsible fruition implemented by the Julian Prealps Natural Park[1], the study area of our research. The park is involved in various projects and initiatives to reinforce ecological connectivity between APAs. The administration organizes guided tours not only to visit local hotspots such as villages, mines and botanic trails, but also to observe wild animals in their natural environment. Moreover, volunteers participate in wildlife initiatives such as, for example, ungulate and avifauna monitoring, and large carnivore surveys. Besides the results regarding citizens' perception and behavior, this study also provided management implications to stakeholders and public administration with basic information, aiming to establish future strategies to disseminate APAs peculiarities more efficiently among citizens.

2. Research methodology

Starting from this, to investigate citizens' perception and behavioral intention towards a responsible fruition of APAs we proposed a conceptual model, adapted from the Theory of Planned Behavior (TPB), in which the behavioral intention was assumed to be affected by environmental awareness, awareness of wildlife and ecological connectivity perception. The TPB model is one of the most widely-used value models in the literature, especially when one wants to explain human behavior and its antecedents. The overarching assertions of the TPB are that individuals make behavioral decisions based on beliefs, and the most accurate predictor of their behavior is the intention to engage in a particular behavior (Ajzen, 1991; Fishbein and Ajzen, 1975)

We used structural equation modeling (SEM) to test the relationships between behavioral intention and its determinants.

2.1. Proposed model

The described conceptual background allowed us to identify and adapt the items from New Ecological Paradigm (NEP) scale (Dunlap et al., 2000), and Ecologically Conscious Consumer Behavior (ECCB) scale (Roberts, 1991; Shetzer et al., 1991), used to measure the proposed constructs, i.e. Environmental

[1] www.parcoprealpigiulie.it

Constructs	Items	Label
Environmental awareness (EA)	Environmental communication is necessary to understand the delicate relationship between man and nature	EA1
	The existence of protected areas in a region involves constraints solely for local human population	EA2
	Living in a greener area improves our wellbeing	EA3
	Environmental concern is just a trend: there is no point in worrying, we can't change things	EA4
	High biodiversity (plants, flowers, insects, mammals, ...) improves the quality of the environment in which I live	EA5
Wildlife awareness (WLA)	It is a pleasure to see wild animals in their natural habitat	WLA1
	The presence of some animal species (wolf, bear, boar, ...) where I live may represent a danger	WLA2
	A territory should ensure wildlife both optimal living habitats (food, shelter…) and ability to move	WLA3
	Life is easier for wild animals where human presence is lower	WLA4
	Human settlements and infrastructure may considerably limit wildlife movement and determine high mortality rates	WLA5
Ecological connectivity perception (ECP)	Ecological connectivity is important to counteract habitat fragmentation and ensure biodiversity preservation	ECP1
	Ecological connectivity should be included in territorial planning	ECP2
	Interventions to improve ecological connectivity brings advantages solely for the natural environment, and disadvantages for humans	ECP3
	Not only areas of high naturalness, such as protected areas, but also semi-natural ones, such as agricultural areas, can guarantee proper ecological connectivity	ECP4
Behavioral intention (BI)	I would rather visit natural parks and protected areas linked within ecological networks instead of other natural areas without ecological connections	BI1
	I would be very pleased to spend a holiday (at least 3 days) in a natural park in which wild animals (wolf, bear, boar…) live freely	BI2
	I would like to take a free or paid guided tour in places where wild animals live	BI3
	I am willing to financially support projects to facilitate wildlife movements	BI4
	I am willing to participate in ecological network initiatives in my spare time	BI5

Table 1. Constructs and proposed measurement scales

awareness (EA), Wildlife awareness (WLA), Ecological connectivity perception (ECP), and Behavioral intention (BI). The selected and adapted items for our purpose are shown in Table 1.

As mentioned, to develop an integrative view of the determinants of citizens' behavioral intention towards a responsible fruition of APAs, we adapted the Theory of Plan Behavior (TPB) as an initial theoretical frame. According to TPB, an individual's behavioral intention, which results in actual behavior, is affected by subjective awareness, attitude and perception; similarly, personal beliefs influence individual attitude and perception. Limiting the domain of the behavioral intention model, intention to engage in a behavior is determined by an individual's attitude and perception towards that behavior (Ajzen, 1991).

The hierarchy is similar to value-attitude-behavior, described in several researches (Homer and Kahle, 1988; Thøgersen and Grunert-Beckmann, 1997). These relationships formed an important starting point for the theoretical basis of the research presented here. Specifically, in the study the model was proposed to investigate the relationships between environmental awareness, awareness of wildlife and citizens' ecological connectivity perception as determinants of behavioral intentions towards a responsible fruition of APAs in a northeastern region of Italy, with the aim of testing the following hypotheses:

H1: Environmental awareness (EA) has a significant impact on Behavioral intention (BI) towards responsible fruition of APAs.

H2: Awareness of wildlife (WLA) has a significant impact on Behavioral intention (BI) towards responsible fruition of APAs.

H3: Ecological connectivity perception (ECP) significantly affects Behavioral intention (BI) towards responsible fruition of APAs.

Furthermore, environmental awareness and its various elements, including awareness of wildlife, have been mentioned as factors that could affect citizens' perception of ecological connectivity (Bradby et al., 2014; Crooks, 2002; Crooks et al., 2011). The proposed model therefore included this latest construct as a mediator of the relationship between the previous two constructs and behavioral intention, considering these additional assumptions:

H4: Environmental awareness (EA) has a significant in-fluence on citizens' ecological connectivity perception (ECP).

H5: Awareness of wildlife (WLA) has a significant influence on citizens' ecological connectivity perception (ECP).

Figure 1 shows the proposed conceptual model. This model formulation, in recognizing that environmental awareness inherently involves behavioral intention, both directly and indirectly, through the individual's ecological connectivity perception, separately considered the influence of awareness of wildlife.

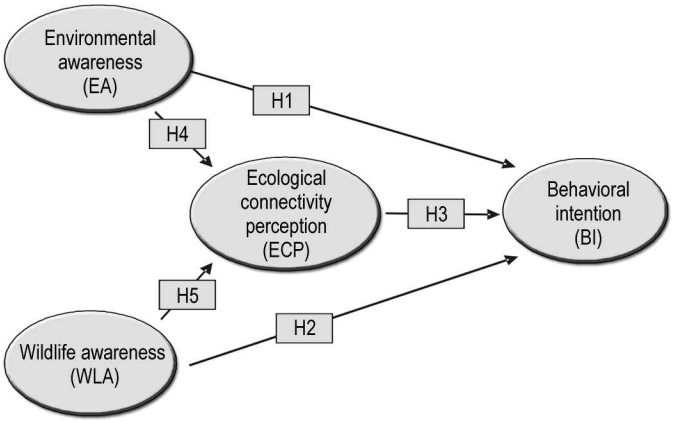


Figure 1. Proposed conceptual model

2.2. Study area

The influence of the above-mentioned constructs on citizens' perception of ecological connectivity and on behavioral intention towards responsible fruition of APAS was tested through a survey on a specific site. The study area was the Julian Prealps Natural Park (Figure 2), one the Pilot Regions of the Platform Ecological Network of the Alpine Convention. The Platform is part of the activities to implement an Alpine ecological network, as defined in Article 12 of the Nature Protection Protocol of the Alpine Convention. Since 2011, the Platform has designated ten Pilot Regions, which cover a large territory that also includes previously existing protected areas. The Pilot Regions are territories, often cross-border, in which specific activities are undertaken to develop ecological connectivity (Angelini and Sammuri, 2017).

The Julian Prealps Natural Park, which extends over 10,000 hectares, comprises the municipalities of Chiusaforte, Lusevera, Moggio Udinese, Resia, Resiutta and Venzone, in the region of Friuli Venezia Giulia (Italy), and has its headquarters in the village of Resia. It borders the Slovenian Triglav National Park. It was established by Regional Law no. 42/1996, which defined

[2] www.alpconv.org/it/organization/groups/WGEcologicalNetwork/default.html

rules on regional parks and nature reserves. Moreover, the park is included in the Natura 2000 network. The territory of the park straddles two distinct Alpine units: the Julian Alps and Julian Prealps, and includes a wide area around Monte Canin (2,587 m), one of the most beautiful peaks in the region. The park is of considerable importance due to its natural and geological features, its wildlife, vegetation, and history.

Although it is not possible to define a socio-demographic structure of the Park because there are no stable settlements, a few data could describe its tendential dimensions. In 2011, there were 6,878 residents (-20.6% compared to 1991), mainly located in the municipalities of Venzone (2,242 people), Moggio Udinese (1,807) and Resia (1,092). Some indicators of population structure show that the average average age is 48.83 years (50.30 in Resia and 45.81 in Venzone).

For tourists, the park offers the opportunity to walk or cycle along numerous paths, which allow the sites of greatest interest to be reached. Agritourisms, mountain shelters and bivouacs provide overnight stays. Access to the protected area is free of charge. The Park also offers schools a wide range of educational and training activities, designed to learn more about the natural and cultural features of the area. These activities also aim to show how a protected natural area can become a laboratory for the correct fruition of the environment.

Figure 2. Study area: Julian Prealps Natural Park

2.3. Sample and data collection

Data were collected in the form of questionnaire surveys, divided into five sections: one for each of the four proposed constructs, and an additional section to gather socioeconomic information on the sample, namely gender, age, educational level, and municipality of residence (inside or outside the Julian Prealps Natural Park area).

The questionnaire used 7-point Likert scale items, with 1 representing “strongly disagree” to 7 representing “strongly agree”. Five items were negatively worded, to avoid response tendencies by the respondents (Cooper and Emory, 1995) and they were reverse-scored for the analysis.

A non-probabilistic convenience sampling method was used to administer the questionnaire. In this exploratory investigation, citizens of the municipalities in the study area, as well as students and academic staff of a northeastern Italian University were invited to participate in the survey. As demonstrated by Boyle (2017), the use of a non-probabilistic sample is reasonable when the objective of the research is not to make statistical inference, but to analyze a still unexplored field. Furthermore, data collection from students is often able to well represent the point of view of a larger community (Ashraf and Merunka, 2017; Depositario et al., 2009; Mjelde et al., 2016). The questionnaire was administered via the CASI (Computer Assisted Self Interviewing) method, a technique for survey data collection in which the respondent complete the survey questionnaire using a computer without an interviewer.

2.4. Data analysis

Structural Equation Modeling was used, as this method was considered specifically appropriate to explicate the latent structure of the causal relationships of the proposed model (Edelenbos and van Meerkerk, 2017). SEM is a statistical tool derived as an extension of Confirmatory Factor Analysis (CFA), which was initially applied to pedagogical and psychological studies (Suzuki, 2011). CFA was performed to test each measurement model. LISREL 9.1 software (Jöreskog and Sörbom, 2012) was used to implement the SEM analysis. We used this software to provide maximum likelihood estimation for all path values simultaneously (Jöreskog and Sörbom, 2012).

The recommended two-stage analytical procedures of SEM were followed. The reliability of each construct was tested with Cronbach’s α coefficients (Cortina, 1993; Nunnally, 1994), and with the Average Variance Extracted (AVE) (Hair et al., 2010). Measurement and structural models were tested and checked with the aim of ensuring that the results were acceptable and consistent with the proposed and underlying conceptual model; the path analysis of the model was then examined to determine and measure the relationships among the constructs and their statistical significance. Four fit indices were calculated to verify how well the model reproduces the observed covariance matrix. Specifically, we used the Goodness of Fit Index (GFI) and the Normed Fit Index (NFI) proposed by Bentler and Bonnet (1980), the Comparative Fit Index (CFI) proposed by Bagozzi (1992), and the Root Mean Square Error of Approximation (RMSEA) proposed by Browne and Cudek (1993).

3. Results

This section presents findings from the questionnaires and the statistical analysis. Sample characteristics constructed from the data precedes results of the hypothesis testing and preliminary insights from the model performance.

3.1. Sample Characteristics

After data cleaning, we retained a sample of 444 valid cases, successfully completed and deemed suitable for data analysis. They correspond to 0.74% of residents in the study area (5,155 people) and 1.86% of the community of the University of Udine (21,776 people), which had been invited to participate in the survey. The characteristics of the sample are summarized in Table 2. The majority of respondents were female, predominantly aged between 20 and 29 years. More than a third hold a high school diploma and 10% are graduates in environmental subjects. Almost all respondents live outside the area of the Julian Prealps Natural Park.

Characteristics	Classes	%
Gender	Female	51.6
Age (years)	< 20	3.8
	20-29	44.1
	30-39	11.3
	40-49	14.9
	50-59	20.5
	> 59	5.4
Education	Graduates	57.8
	High school	39.8
Residence	Outside park area	91.4

Table 2. Characteristics of the sample (N = 444)

3.2. Statistical model and analysis

The reliability of each construct was confirmed by Cronbach’s α coefficients, which indicated an acceptable level (moderate level for WLA) of internal consistency of each construct. In addition, the Average Variance Extracted (AVE) for each construct suggested convergent validity. As summarized in Table 3, the results of the first step of the analysis indicate that

the measurement scales proposed here coherently describe and reflect the four latent constructs.

Constructs and items		Mean	s.d.	λ	α	AVE
Environmental awareness (EA)					0.73	0.45
	EA1	6.42	1.07	0.68		
	EA2	5.74	1.56	0.39		
	EA3	6.57	0.93	0.78		
	EA4	6.39	1.10	0.42		
	EA5	6.52	1.07	0.70		
Wildlife awareness (WLA)					0.55	0.42
	WLA1	6.15	1.05	0.63		
	WLA2	3.78	1.87	0.19		
	WLA3	6.32	1.07	0.65		
	WLA4	5.61	1.35	0.29		
	WLA5	5.66	1.43	0.43		
Ecological connectivity perception (ECP)					0.64	0.62
	ECP1	6.20	1.15	0.84		
	ECP2	5.75	1.05	0.79		
	ECP3	5.71	1.31	0.79		
	ECP4	5.62	1.28	0.73		
Behavioral intention (BI)					0.73	0.41
	BI1	5.10	1.52	0.46		
	BI2	5.41	1.70	0.66		
	BI3	5.41	1.70	0.69		
	BI4	4.68	1.79	0.52		
	BI5	4.20	1.89	0.57		

Table 3. Constructs and measurement items

A summary of the fit indices is presented in Table 4. The incremental fit indices provide indications of good adaptation of the conceptual model, being 0.91 for the NFI and 0.93 for the CFI, respectively. Similarly, the RMSEA value of 0.06 is indicative of the good adaptation of the model to the data. As these values indicate a good fit between the model and the observed data, it is possible to proceed with hypotheses testing.

Table 4. Main indices of model fitting

Global fit indices	Value
GFI	0.83
NFI	0.91
CFI	0.93
RMSEA (Test of Close Fit)	0.06

The fit indices proposed in the SEM analysis confirmed the existence of direct causal effects between the latent variables. The analysis confirmed the direct causal relations presented in hypotheses H2, H3, H4 and H5, as well as the indirect effect of WLA on BI mediated through ECA. On the contrary, the model neither statistically supports hypothesis H1, nor the indirect effect of EA on BI through the mediation of ECA. This evidence is shown in Table 5 as well as in the path analysis presented in Figure 3.

Considering these results, the model sheds some lights on the dynamics of responsiveness towards protected areas, which seems to be affected more by specific and closely interlinked environmental elements, such as awareness of wildlife and perception of ecological connectivity, rather than by general environmental concerns.

Hypothesis	Estimate (standardized)	Standard error	t-value
Direct effects			
(H1) EA → BI	-0.45	0.06	n.s.*
(H2) WLA → BI	0.95	0.05	2.31
(H3) ECP → BI	0.22	0.04	1.97
(H4) EA → ECP	0.47	0.03	2.25
(H5) WLA → ECP	0.43	0.07	1.96
Total effects mediated via ECP			
EA → BI	-0.35	0.13	n.s.*
WLA → BI	1.04	0.07	2.63

* n.s.: not significant (|t-value| < 1.96)

Table 5. Direct and indirect effects between the constructs

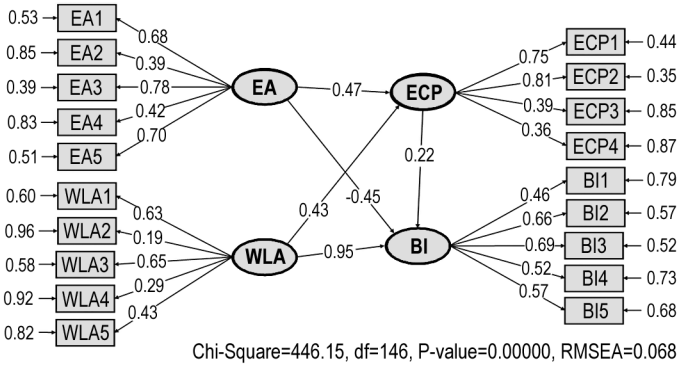


Figure 3. Path analysis of the proposed model

5. Discussion and conclusion

This research focused on protected areas, in particular on an Alpine protected area, with the aim of analyzing the citizens' behavioral intention towards these habitats, which play a crucial role in the protection and enhancement of natural, social and economic values.

The findings were useful for highlighting a crucial aspect: managing natural resources needs effective planning. It becomes increasingly important in this context, as does the need for integrated landscape management to accommodate citizens' points of view on appropriate land use (Mann et al., 2018). This applies to multiple contexts of land use, but not least, where plans for tourism and needs for ecological connectivity structures come together. For this reason, it is important to get people to not only accept, but also to understand and appreciate environmental investments in ecological corridors, greenbelts and other linking elements, with a positive perception of costs and benefits involved, and their technological aspects, as is demonstrated in the case of delivery of waste management infrastructure (Kirkman and Voulvoulis, 2017), waste recycling (Chan, 1998), vernal pool conservation (McGreavy et al., 2012) and agricultural activities (Bradby et al., 2014). In our study, communication on sensitive topics, such as the importance of biodiversity for the quality of the environment, where people live and of their own lives, emerged as a strong determinant of people's environmental awareness. On the other hand, environmental awareness alone is not sufficient to influence and motivate behavioral intention. In fact, awareness of wildlife and positive perception of ecological connectivity, which are indeed closely interlinked, are strong determinants of behavioral intention towards APAs. The respondents had positive feelings towards wildlife: the presence of bears, wolves and other large carnivores in their usual haunts is not a cause for concern or fear. In other words, respondents' awareness about wildlife, in particular with respect to large carnivores, coupled with their positive perception of investments aimed at reducing habitat fragmentation, positively affected their intention to visit protected areas and provide financial and personal support for their sustainable development. Furthermore, they seem aware of the importance of both patches and connections that provide living space and corridors for fauna. This mindset informs a positive perception of ecological infrastructures, which are seen as important for the reduction of habitat fragmentation and thus for the conservation of biodiversity. The behavioral intention towards protected areas mainly results in an interest in spending one or more days in areas where wild animals live. No less important is the intention to devote time to creating connection infrastructures or participate in other specific projects, even as volunteers.

In terms of practical implications, these findings may drive the adoption of policies, including marketing activities, aimed at bolstering the responsible fruition both of Alpine protected areas and the Alps as a whole, for instance, promoting ecotourism, eco-friendly outdoor sports and recreation, and volunteering in mountain associations. Although limited to citizen's perspectives

on a particular aspect of land use, ecological connectivity structures, this paper demonstrates the need for inclusion of a wide range of stakeholders and interest groups in decision making about land use options. Involving a variety of groups is critically important to discover and address coherent values, interests and conflicts. It is therefore suggested that tourism organizers and stakeholders recognize important potential market opportunities, with the corresponding needs and demands of residents and develop an appropriate marketing program. As the tourism industry has environmental, social, cultural and economic impacts, and, as reported by Liu (2003), is necessary to manage tourism growth in a way that is appropriate to the tourists, the destination environment and the host population, the creation of connections (as an indicator of environmental care, specifically bound to wildlife protection) may act as a lever to attract tourists, and could be a potential opportunity to stimulate the local economy with services, such as hotels, transportation and restaurants.

Even though our research focused on behavioral intention towards the fruition of protected areas and its implications for conservation program design, the results also offer valuable insights into how to improve generic policy design and adoption in mountain and protected areas. Indeed, local residents and stakeholders' affection for these areas may hinder the adoption of strong, impactful policies, such as broad rural development plans or industrial reconversion programs. For this reason, the inclusion of meaningful conservation and environmental planning provisions might promote policy acceptance and support among locals and stakeholders.

Finally, the findings from this study on behavioral intention towards the fruition of protected areas provide a beginning for baseline data that can be used for future monitoring in the area. Such a management approach is strongly recommended.

5.1. Limitations and further research

Our study, in common with much other research, is not without limitations. The use of a convenience sample, and the CASI sample selection method, did not allow us to generalize the results of the research to broader populations. Despite these limitations, the results provided interesting insights into the topic and paved the way for future research. Alternative and more representative samples, in terms of sociodemographic characteristics, size, and geographical area, would improve our understanding on these topics and ease result generalization. Similarly, the use of face-to-face methods could be more effective, not only in data collection, but also in environmental communication. In this respect, it is well known that a questionnaire survey, as well as other methodologies, could together represent both the means and the objective. Surveys are not only useful data collection tools (analysis tool), but are effective instruments to transfer knowledge and strengthen awareness about research issues (communication tool) as well (Bassi et al., 2014; Batini and Capecchi, 2005). Further rese¬arch is also needed as several studies indicated that environmental awareness is strongly influenced by culture and social interaction (Zecha, 2010; Duarte et al., 2017; Lee and Shi, 2014). Finally, the use of the proposed constructs and their measurement scales could be further extended in future investigations, perhaps including qualitative approaches and multi-group analysis, in order to improve their effectiveness.

Acknowledgements

We would like to thank the staff of the Julian Prealps Natural Park and Dr. Sara Moruzzi for their great support and thoughtful contribution to the research.

References

[1] Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50 (2), 179-211.

[2] Angelini, P., Sammuri, G. (Eds.) (2017). *Sviluppare il potenziale delle aree protette alpine* – I° Report della Rete SAPA. www.areeprotette-sapa.it.

[3] Ashraf, R., Merunka D. (2017). The use and misuse of student samples: An empirical investigation of European marketing research. *Journal of Consumer Behavior*, 16(4), 295-308.

[4] Bagozzi, R.P. (1992). The self-regulation of attitudes, intentions, and behavior. *Social Psychology Quarterly*, 55, 178-204.

[5] Baiamonte, G., Domina, G., Raimondo, F.M., Bazan, G. (2015). Agricultural landscapes and biodiversity conservation: a case study in Sicily (Italy). *Biodiversity and Conservation*, 24 (13), 3201-3216.

[6] Balzaretti, E., Gargiulo, B. (2011). *La comunicazione ambientale: sistemi, scenari e prospettive. Buone pratiche per una comunicazione efficace*. Franco Angeli, Milano.

[7] Bartaletti, F. (2009). *Geografia e cultura delle Alpi*. Franco Angeli, Milano.

[8] Bassi, I., Zaccarin, S., De Stefano, D., (2014). Rural inter-firm networks as basis for multifunctional local system development: Evidence from an Italian alpine area. *Land Use Policy*, 38, 70-79.

[9] Batini, F., Capecchi, G., (Eds.) (2005). *Strumenti di partecipazione. Metodi, giochi e attività per l'empowerment individuale e lo sviluppo locale*. Erickson, Trento.

[10] Battisti, C. (2003). Habitat fragmentation, fauna and ecological network planning: towards a theoretical conceptual framework. *Italian Journal of Zoology*, 70 (3), 241-247.

[11] Bätzing, W. (2005). *Le Alpi. Una regione unica al centro dell'Europa*. Bollati Boringhieri, Torino.

[12] Bauer, N., Vasile, M., Mondini, M. (2018). Attitudes towards nature, wilderness and protected areas: a way to sustainable stewardship in the South-Western Carpathians. *Journal of Environmental Planning and Management*, 61(5-6), 857-877.

[13] Belardi, M., Catullo, G., Massacesi, C., Nigro, R., Padoan, P., Walzer, C. (2011). *Webs of life – Alpine biodiversity needs ecological connectivity – Results from the ECONNECT project*. Grafica Metelliana, Milano.

[14] Bentler, P. M., Bonnet, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88 (3), 588-606.

[15] Bhatia, S., Redpath, S. M., Suryawanshi, K., Mishra, C. (2017). The relationship between religion and attitudes toward large carnivores in Northern India? *Human Dimensions of Wildlife*, 22(1), 30-42.

[16] Boyle, K. (2017). *Contingent valuation in practice*. In: Champ, P.A., Boyle, K., Brown, T.C. (Eds.), *A Primer on Nonmarket Valuation*. Springer, Dordrecht.

[17] Bradby, K., Fitzsimons, J.A., Del Marco, A., Driscoll, D.A., Ritchie, E.G., Lau, J., Bradshaw, C.J.A., Hobbs, R.J. (2014). Ecological connectivity or Barrier Fence? Critical choices on the agricultural margins of Western Australia. *Ecological Management & Restoration*, 15 (3), 180-190.

[18] Browne, M.W., Cudeck, R. (1993). *Alternative ways of assessing model fit*. In: Bollen, K.A., Long, J.S. (Eds.), *Testing Structural Equation Models*. Sage, Beverly Hills, CA.

[19] Burns, G. L., Haraldsdóttir, L. (2019). Hydropower and tourism in Iceland: Visitor and operator perspectives on preferred use of natural areas. *Journal of Outdoor Recreation and Tourism*, 25, 91-101.

[20] Carter, N. H., Linnell, J. D. (2016). Co-adaptation is key to coexisting with large carnivores. *Trends in Ecology & Evolution*, 31 (8), 575-578.

[21] Chan, K. (1998). Mass communication and pro-environmental behavior: waste recycling in Hong Kong. *Journal of Environmental Management*, 52 (4), 317-325.

[22] Chester, C.C., Hilty J.A. (2010). *Connectivity science*. In: Worboys, G.L., Francis, W.L., Lockwood, M. (Eds.), *Connectivity Conservation Management – A Global Guide*. Earthscan, London, UK.

[23] Conrad, J.M., Gomes, C.P., van Hoeve, W.J., Sabharwal, A., Suter, J.F. (2012). Wildlife corridors as a connected subgraph problem. *Journal of Environmental Economics and Management*, 63 (1), 1-18.

[24] Cooper DR, Emory WC. (1995). *Business Research Methods*. Irwin: Chicago.

[25] Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. Journal of applied psychology, 78(1), 98.

[26] Crooks, K.R. (2002). Relative sensitivities of mammalian carnivores to habitat fragmentation. *Conservation Biology*, 16, 488-502.

[27] Crooks, K.R., Burdett, C.L., Theobald, D.M., Rondinini, C., Boitani, L. (2011). Global patterns of fragmentation and connectivity of mammalian carnivore habitat. Philosophical *Transactions of the Royal Society B: Biological Sciences*, 366 (1578), 2642-2651.

[28] Crooks, K.R., Sanjayan, M. (2006). *Connectivity Conservation*. Cambridge University Press, Cambridge, UK.

[29] Depositario, D.P.T., Nayga Jr R.M., Wu X., Laude T.P. (2009). Should students be used as subjects in experimental auctions?. *Economics Letters*, 102, 122-124.
[30] Dudley, N. (Ed.) (2008). *Guidelines for Applying Protected Area Management Categories*. IUCN, Gland, Switzerland.
[31] Dunlap, R. E., Van Liere, K. D., Mertig, A. G., Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of social issues*, 56(3), 425-442.
[32] Edelenbos, J., van Meerkerk, I. (2017). Finding common ground in urban governance networks: what are its facilitating factors? *Journal of Environmental Planning and Management*, 61(12), 2094-2110.
[33] Ednarsson, M. (2006). Attitudes towards large carnivores and carnivore tourism among tourism entrepreneurs in Sweden. *Revue de Geographie Alpine – Journal of Alpine Research*, 94 (4), 58-67.
[34] EEA, European Environment Agency (2012). *Protected Areas in Europe – An Overview. European Environmental Agency Report*, 5/2012, Copenhagen. www.eea.europa.eu/publications/protected-areas-in-europe-2012.
[35] EEA, European Environment Agency (2017). *An introduction to Europe's Protected Areas*. www.eea.europa.eu/downloads/3f57fe47e6b6437e80b6c828f72d95e6/1506595356/europe-protected-areas-1.pdf.
[36] Fishbein, M., Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Addison-Wesley, Reading, MA.
[37] Gilioli, G., Schrader, G., Carlsson, N., van Donk, E., van Leeuwen, C. H., Martín, P. R., Vos, S. (2017). Environmental risk assessment for invasive alien species: A case study of apple snails affecting ecosystem services in Europe. *Environmental Impact Assessment Review*, 65, 1-11.
[38] Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., Tatham, R.L. (2010). *Multivariate Data Analysis*. 7th ed. Prentice-Hall, Upper Saddle River, NJ.
[39] Hannah, L. (2011). Climate change, connectivity, and conservation success. *Conservation Biology*, 25(6), 1139-1142.
[40] Hannah, L., Midgley, G., Andelman, S., Araujo, M., Hughes, G., Martinez-Meyer, E., Pearson, R., Williams, P. (2007). Protected area needs in a changing climate. *Frontiers in Ecology and the Environment*, 5(3), 131-138.
[41] Hilty, J.A., Lidicker, W.Z., Merenlender, A. M. (2006). *Corridor Ecology: The Science and Practice of Linking Landscapes for Biodiversity Conservation*. Island Press, Washington, DC, USA.
[42] Homer, P.M., Kahle, L.R. (1988). A structural equation test of the value-attitude behavior hierarchy. *Journal of Personality and Social Psychology*, 54, 638–646.
[43] Imran, S., Alam, K., Beaumont, N. (2014). Environmental orientations and environmental behaviour: Perceptions of protected area tourism stakeholders. *Tourism Management*, 40, 290-299.
[44] Jones N., Malesios C., Ioannidou E., Kanakaraki R., Kazoli F., Dimitrakopoulos P.G. (2018). Understanding perceptions of the social impacts of protected areas: Evidence from three NATURA 2000 sites in Greece. *Environmental Impact Assessment Review*, 73, 80-89.
[45] Jöreskog, K.G., Sörbom, D. (2012). *LISREL 9.10 for Windows* [Computer software]. Scientific Software International, Skokie, IL.
[46] Kirkman, R., Voulvoulis, N. (2017). The role of public communication in decision making for waste management infrastructure. *Journal of Environmental Management*, 203 (2), 640-647.
[47] Lindsay, P. H., Norman, D. A. (1977). *Human Information Processing: An Introduction to Psychology* (2nd ed.). New York, NY: Academic Press.
[48] Linnell, J.D.C., Kaczensky, P., Wotschikowsky, U., Lescureux, N., Boitani, L. (2015). Framing the relationship between people and nature in the context of European conservation. *Conservation Biology*, 29 (4), 978-985.
[49] Liu, Z. (2003). Sustainable tourism development: A critique. *Journal of sustainable tourism*, 11(6), 459-475.
[50] Madadi, H., Moradi, H., Soffianian, A., Salmanmahiny, A., Senn, J., Geneletti, D. (2017). Degradation of natural habitats by roads: Comparing land-take and noise effect zone. *Environmental Impact Assessment Review*, 65, 147-155.
[51] Mann, C., Garcia-Martin, M., Raymond, C. M., Shaw, B. J., Plieninger, T. (2018). The potential for integrated landscape management to fulfil Europe's commitments to the Sustainable Development Goals. *Landscape and urban planning*, 177, 75-82.
[52] McGreavy, B., Webler, T., Calhoun, A.J.K. (2012). Science communication and vernal pool conservation: A study of local decision maker attitudes in a knowledge-action system. *Journal of Environmental Management*, 95 (1), 1-8.
[53] McIntosh, D., Wright, P.A. (2017). Emotional processing as an important part of the wildlife viewing experience. *Journal of Outdoor Recreation and Tourism-Research Planning and Management*, 18, 1-9.
[54] Mjelde, J.W., Israel Schwarzlose A.A., Dudensing R.M., Jin Y., Cherrington L.K., Chen, J. (2016). Subject pool effects among the general population and students: a choice experiment example. *Applied Economics Letters*, 23(14), 1018-1021.
[55] Mueller, J. T., Taff, B. D., Wimpey, J., Graefe, A. (2018). Small-scale race events in natural areas: Participants' attitudes, beliefs, and global perceptions of leave no trace ethics. *Journal of Outdoor Recreation and Tourism*, 23, 8-15.
[56] Mutanga, C. N., Vengesayi, S., Chikuta, O., Muboko, N., Gandiwa, E. (2017). Travel motivation and tourist satisfaction with wildlife tourism experiences in Gonarezhou and Matusadona National Parks, Zimbabwe. *Journal of Outdoor Recreation and Tourism*, 20, 1-18.
[57] Nunnally, J.C. (1994). *Psychometric Theory*. McGraw-Hill, New York, NY.
[58] Ormsby, A., Kaplin, B.A. (2005). A framework for understanding community resident perceptions of Masoala National Park, Madagascar. *Environmental Conservation*, 32 (2), 156-164.
[59] Park, E., Lee, S., Peters, D.J. (2017). Iowa wetlands outdoor recreation visitors' decision-making process: An extended model of goal-directed behavior. *Journal of Outdoor Recreation and Tourism*, 17, 64-76.
[60] Pearce, J., Dowling, R. (2019). Monitoring the quality of the visitor experience: An evolutionary journey. *Journal of Outdoor Recreation and Tourism*, 25, 87 - 90.
[61] Pelegrina-Lopez, A., Ocana-Peinado, F.M., Henares-Civantos, I., Rosua-Campos, J.L., Serrano-Bernardo, F.A. (2018). Analyzing social perception as a key factor in the management of protected areas: the case of the Sierra Nevada Protected Area (S Spain). *Journal of Environmental Planning and Management*, 61 (1), 124-142.
[62] Plassmann, G., Kohler, Y., Badura, M., Walzer, C. (2016). Alpine Nature 2030. *Creating [ecological] connectivity for generations to come*. Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), Berlin.
[63] Roberts, James Andrew (1991). *Development of a profile of the socially responsible consumer for the 1990s and its marketing management and public policy implications*. ETD collection for University of Nebraska - Lincoln. AAI9200149.
[64] Røskaft, E., Händel, B., Bjerke, T., Kaltenborn, B.P. (2007). Human attitudes towards large carnivores in Norway. *Wildlife Biology* 13 (2), 172-185.
[65] Scolozzi, R., Geneletti, D. (2012). A multi-scale qualitative approach to assess the impact of urbanization on natural habitats and their connectivity. *Environmental Impact Assessment Review*, 36, 9-22.
[66] Shetzer, L., Stackman, R.W., Moore, L.F. (1991). Business-environment attitudes and the new environmental paradigm. *The Journal of Environmental Education*, 22(4), 14-21.
[67] Suzuki, J. (2011). Structural modeling of the value of patent. *Research Policy*, 40 (7), 986-1000.
[68] Thøgersen, J., Grunert-Beckmann, S.C. (1997). Values and attitude formation towards emerging attitude objects: From recycling to general, waste minimizing behavior. *Advances in Consumer Research*, 24, 182–189.
[69] Todd S. (2002). Building consensus on divisive issues: a case study of the Yukon wolf management team. *Environmental Impact Assessment Review*, 22 (6), 655-684.
[70] Tverijonaite, E., Ólafsdóttir, R., Thorsteinsson, T. (2018). Accessibility of protected areas and visitor behaviour: A case study from Iceland. *Journal of Outdoor Recreation and Tourism*, 24, 1-10.

Labeling of Fresh Fruits and Vegetables

Sabka PASHOVA [1*], Radoslav RADEV [2]

[1] Associate professor, PhD, Commodity Science Department, University of Economics – Varna, 77 Knyaz Boris I Blvd., 9002 Varna, Bulgaria; E-mail: spashova@ue-varna.bg
[2] Assistant professor, PhD, Commodity Science Department, University of Economics – Varna, 77 Knyaz Boris I Blvd., 9002 Varna, Bulgaria; E-mail: r.radev@ue-varna.bg
[*] Corresponding author

Abstract

Food labeling (including for fresh fruits and vegetables) is regulated in the Regulation on the requirements for the labeling and presentation of foodstuffs and in Regulation (EU) No 1169/2011. A study has been conducted on the presence of optional labeling on fresh fruits and vegetables, depending on the method of cultivation/production (conventional, bio-products, GMO-products), in bulk in the commercial network on the territory of Bulgaria. For this purpose, a survey was conducted in 5 chains of commercial sites on the territory of the country during the period 2019-2020. The purpose of this paper is to investigate the labeling of fresh fruits and vegetables available in bulk in the Bulgarian commercial network.
The conducted study revealed that a significant part of fresh fruits and vegetables offered in bulk in the Bulgarian commercial network are unmarked; followed by those with labels of conventional production and bio labeling; GMO labeling on fresh fruits and vegetables has not been found.
It was found and proved that the Bulgarian and European legislation in the field of labeling of fresh fruits and vegetables is well developed. The results obtained are evidence that a considerable part of the fresh fruits and vegetables offered commercially in bulk in Bulgaria do not contain optional labels. This is a prerequisite for rethinking the legislative framework for labeling of fresh fruit and vegetables, which would make some labeling signs from optional to obligatory.

Keywords: *labeling; conventional, bio, GMO labeling; fresh fruits; fresh vegetables.*

1. Introduction

Fresh fruits and vegetables are a source of essential nutrients (Naveena and Immanuel, 2017). These are water, carbohydrates, fats, proteins, fibers, minerals, organic acids, vitamins, antioxidants and others. The nutritional value of fresh fruits and vegetables depends on their composition, and it depends on the species, variety, degree of ripeness (Vicente, et al., 2009), soil and climatic conditions and their fertilization. Consumption of fresh fruits and vegetables is associated with a reduced risk of cancer, heart disease, stroke and other chronic diseases (Kader, 2001).

Food labeling (including for fresh fruits and vegetables) is regulated in the Ordinance on the requirements for the labeling and presentation of foodstuffs and in Regulation (EU) No 1169/2011. According to the Ordinance on the requirements for the labeling and presentation of foodstuffs and Regulation (EU) No 1169/2011 it is obligatory to indicate the following information, written in Bulgarian language: (a) the name of the food; (b) a list of the constituents in the composition; (c) all ingredients or accompanying compounds, including those causing allergies or intolerance, that are used in the production or preparation of food and are still present in the product, even in the modified form; (d) the quantity of certain ingredients or categories of ingredients; (e) net weight – in the case of prepacked foods; (f) minimum durability or shelf life or the label "USE BEFORE" – a specific date is indicated on foods that, from a microbiological point of view, are subject to rapid deterioration; (g) special storage conditions and / or conditions of use; (h) the name or business name and address of the producer or of the person packing the food or of the seller established within the Community; (i) country of origin or place of provenance; (j) instructions for use – in the absence of such instructions, it would be difficult to use the food properly; (l) nutrition declaration; (m) a marking to identify the batch to which the food belongs; (n) in the case of imported food, the country of origin shall be indicated, and where in another country the food has undergone a process which causes a change in its nature, the country of origin shall be indicated on the label as the country of origin. Data may be published in languages other than Bulgarian (Regulation on requirements for labeling and presentation of foodstuffs, Regulation (EU) No 1169/2011).

The objective of this paper is to provide a comprehensive overview of the existing situation and to study the labelling of fresh fruits and vegetables offered commercially in bulk in the Bulgarian commercial network. For the goal fulfillment we use *the descriptive-analytical method* – theoretical aspects of the studied scientific field are investigated on the basis of literature research. The information collected is summarized and analyzed; systematic approach; analytical approach; study of the works of authors in the field; comparative analysis; method of observation; determination of relative shares.

The study has been conducted on the presence of optional labeling on fresh fruits and vegetables, depending on the method of cultivation/production (conventional, bio-products, GMO-products), in bulk in the commercial network on the

territory of Bulgaria. For this purpose, a *survey was conducted in 5 chains of commercial sites on the territory of the country during the period 2019-2020*.

2. Results and Discussion

Organic fresh fruits and vegetables. Fresh fruits and vegetables are called organic (bio) when they are produced by persons holding a certificate of organic production (organic production rules are followed and control is carried out). Producers of organic products MUST NOT use: synthetic pesticides (herbicides, insecticides or fungicides); genetically modified organisms; growth regulators and more. They MUST: have a farm management system in accordance with organic farming rules; use some good practices to control pests, diseases and weeds, such as cultivation and resistant varieties; use natural manure, compost or greenhouse production to increase yields (Ivanova et al., 2012). The consumers' concerns towards the organic foods is connected with their composition, which proof that they are healthier and safer than conventional foods (Vasileva, et. al. 2019).

A number of studies have shown that organic fresh fruits and vegetables contain more minerals, vitamins and biologically active substances than conventional ones.

Conventional fresh fruits and vegetables. Pesticides, herbicides and fungicides are used in the production of conventional fresh fruits and vegetables to protect crops and plants from pests. Chemical fertilizers are used to process crops and provide the necessary nutrients for plants, and animal manure needs to stand for some time before being used, as some of the substances must undergo transformation. In conventional production, the use of pesticides, herbicides and fungicides, which are thought to be present in residues and in food, has an impact on the quality of fresh fruits and vegetables (Bordeleau, et al., 2002).

GMOs fresh fruits and vegetables. Genetically modified organisms (GMOs) are a controversial topic, as the benefits to both food producers and consumers are compounded by potential risks and side effects for both humans and the environment. The growing public concern about genetically modified foods (GMCs) is addressing the health issues that may be the result of modern biotechnology. Independent research is being conducted worldwide to evaluate the benefits and disadvantages of GMCs and in particular fresh fruits and vegetables (Zhang, et al., 2016).

Genetic modification is a biological technique that affects changes in the genetic mechanism of all kinds of living organisms (including fresh fruits and vegetables). GMOs are defined by the World Health Organization (WHO) as: "organisms (ie plants, animals or micro-organisms) in which the genetic material (DNA) is altered in a way that does not naturally occur through reproduction and / or natural recombination (including fresh fruits and vegetables)". The Food and Agriculture Organization (FAO), the United Nations Specialized Agency (UN) and the European Commission define GMOs as a product "that does not occur naturally through reproduction and / or natural recombination". Therefore, GMO fresh fruits and vegetables are produced from genetically modified plants (Zhang, et al., 2016).

2.1. Labeling of Organic Fresh Fruits and Vegetables

Countries with developed organic markets have widespread national signs that are well recognized by consumers. This is proof that the introduction of a single national organic label is one of the factors driving the sale of these foods. European legislation has required producers of packaged organic foods to use a "new" EU organic logo after 1 July 2010 (Figure 1). The new label was introduced by Commission Regulation 271/2010 of 24 March 2010 and, unlike the previous labeling, it is mandatory for bio-products. The use of the Community logo on organic food from third countries is voluntary (Ivanova et al., 2012).

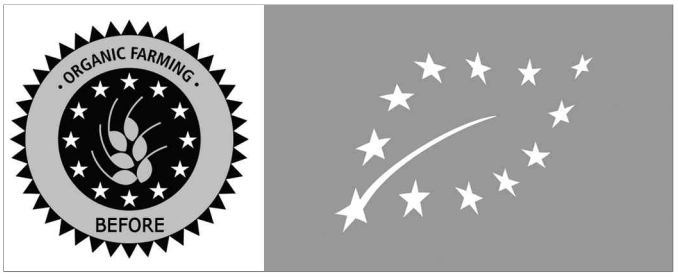


Figure 1. EU logo on organic farming, organic products, organic foods

Source: Биоземеделие, био продукти, продукти, био храни, екология, здраве/Organic farming, organic products, organic food, ecology, health, https://www.google.com/search?q=Лого+на+ЕС+за+биопродукти&client=opera&hs=w9X&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjbn8in2KPoAhUjhOAKHVSnBnsQ_AUoAXoECAsQAw&biw=1195&bih=547#imgrc=phItczvnGDqpvM

Through the use of the bio-logo, consumer awareness is raised, and they are assured that when purchasing an EU-branded product: 95% of the components in the product are agricultural, and are organic production; the product complies with the requirements of the conventional control scheme; the product is delivered directly from the manufacturer and is preliminary pre-packaged; the product bears: the name of the manufacturer, processor or supplier; the name or registration code of the control body (Ivanova et al., 2012).

2.2. Labeling of conventional fresh fruit and vegetables

Labeling of fresh fruits and vegetables is regulated in Bulgarian (Ordinance No 16 of 28 May 2010) and Union law (543/2011 / EU: Implementing Regulation (EU) No 543/2011).

Fresh fruits and vegetables are labeled according to the marketing requirements, depending on the type of product concerned. The information which must be clearly visible on the package itself or on a label, an integral part of the package or permanently affixed to it is the following: 1. name and country of origin of the product; 2. quality class, variety and commercial type. In the case of fruit and vegetables carried in bulk, the dates must be given in the accompanying documents or in a prominent place in the vehicle. In retailing, traders are required to provide the required information for the name, country of origin and producer / packer of the product, as well as class quality, variety and commercial type (Ordinance No. 16 of May 28, 2010).

The requirements towards labeling of fresh fruit and vegetables are reflected in parts of Implementing Regulation (EU) No 543/2011, which is divided into two sections. Part one of the first section of the common marketing standard provides information on the origin of fresh fruit and vegetables i.e. must be given: the full name of the country of origin. For fresh fruit and vegetables originating in a Member State, the name shall be in the language of the country of origin or in another language which is understandable for the consumers in the country of destination. For other fresh fruits and vegetables, the name shall be in a language which is understandable to the consumer in the country of destination.

Part 2 of the Specific Marketing Standards section provides information on the labeling of various fresh fruits and vegetables. Each package must bear the following particulars, in legible and indelible characters, grouped on the same side of the packaging and visible from the outside: identification – the

name and address of the packer and / or dispatcher (or equivalent abbreviations); the origin of the product for all fresh fruit and vegetables must be indicated – country of origin and, optionally, region of production (national, regional or local name); commercial characteristics – quality class; size, expressed as minimum and maximum diameter (in, mm) or minimum and maximum weight (in g) or category code. The official control mark is optional for the various fruits and vegetables.

The described above particular props in the labeling are not obligatorily marked on the packages if the latter contain commercial packages which are clearly visible from the outside and on each of them the information is indicated. Packaging labeling shall not contain any misleading indications. When fruits and vegetables are on pallets, the dates must be indicated on a label prominently displayed on at least two sides of the pallet (543/2011 / EU: Implementing Regulation (EU) No 543/2011).

The described requisites of fresh fruit and vegetable labeling required under Ordinance No 16 of 28 May 2010 and 543/2011 / EU: Implementing Regulation (EU) No 543/2011 is obligatory. They must be clearly and legibly written in order to increase consumer awareness in their choice of fresh fruits and vegetables.

2.3. Labeling of GMOs fresh fruit and vegetables

The labeling of foods containing or consisting of GMOs or produced from/containing ingredients produced from GMOs (including fresh fruits and vegetables) is reflected in Regulation (EC) No 1829/2003.

The requirements of Community legislation on the labeling of GMOs fresh fruit and vegetables are as follows: (a) when the food consists of more than one component, it shall be "genetically modified" or "produced by the genetically modified (component name)". The component must be from the list provided for in Article 6 of Directive 2000/13 / EC; (b) where the ingredient is indicated by a category name, the words "contains genetically modified (name of the organism)" or "contains (name of the ingredient) derived from a genetically modified (name of the organism)" – must be on the list of ingredients; (c) where no ingredient list is available, the words "genetically modified" or "produced by a genetically modified (organism's name)" must appear clearly on the label; (d) that referred to in points (a) and (b) may also be reflected in a footnote to the ingredient list, printed in a font of the same size as that of the ingredient list; (e) where the food is offered for sale to the consumer as unpackaged food or as packaged food, the information must be permanently and visibly present on the label / next to it or on packaging material in a larger font so that it can be more easily detected and read (Regulation (EC) No 1829/2003).

According to the International Federation of Standards for Fresh Fruits and Vegetables, PLU codes (Price look-up codes) have been used as the recommended labeling since 1990.

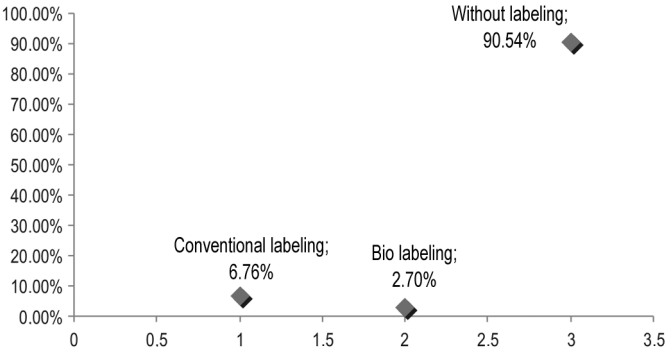
These are voluntary stickers with 4 or 5 digit code, which are placed by the suppliers of goods. The code provides merchants with information about the good, pricing and its identification.

The codes displayed on the stickers orient consumers in the way of growth and production of fresh fruits and vegetables (organic, conventional and GMOs). The product is: Organic, chemical-free, when the 5-digit code starts with the number 9; conventional, derived from conventional farming and grown using chemicals and pesticides when the 4-digit code begins with the number 4; GMOs when there is a figure 8 in front of the 5-digit code.

2.4. Study on the labeling of fresh fruits and vegetables commercially available in Bulgaria

Graphs 1, 2, 3, 4 and 5 show the results of a study on the presence of optional labels on fresh fruits and vegetables in bulk, available commercially in Bulgaria (5 retail outlets are studied), depending on the way of cultivation / production (conventional, bio, GMO).

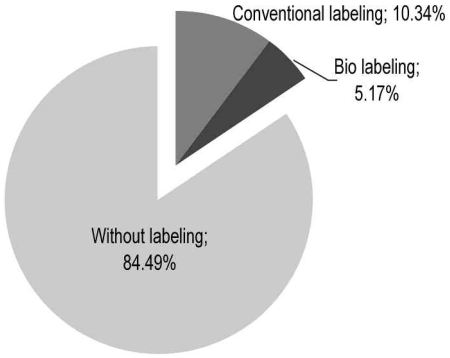
Graph 1 presents the study of fresh fruit and vegetable labels at shopping center A.



Graph 1. Labeling of fresh fruits and vegetables in bulk at shopping center A
Source: Authors research

It was found from the study of fresh fruit and vegetable labeling at shopping center A that over 90% of fresh fruit and vegetables in bulk are unlabeled, over 6% are labeled for conventional production and less than 3% are with bio labels. In the study at shopping center A, no fresh fruits and vegetables were identified with GMO branding.

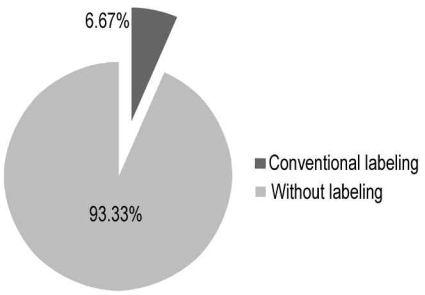
Graph 2 shows the results of the study on the labeling of fresh fruits and vegetables at commercial establishment B.



Graph 2. Labeling of fresh fruit and vegetables in bulk at a commercial center B
Source: Authors research

Summarized data show that almost 85% of fresh fruit and vegetables offered in bulk in commercial center B are unlabeled, followed by fresh fruits and vegetables with conventional labeling (10.34%) and those with bio marking (5.17%). In store B were not offered and identified fresh fruits and vegetables with GMO labels (graph 2).

Graph 3 presents the results of the study of labeling of fresh fruits and vegetables at commercial site C.

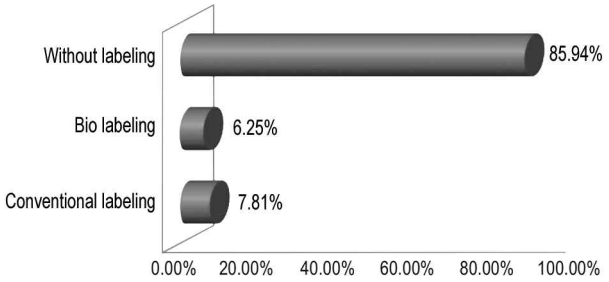


Graph 3. Labeling of fresh fruits and vegetables at commercial site C
Source: Authors research

It was found that more than 93% of the fresh fruit and vegetables offered in bulk are available at commercial center C

without labeling; just fewer than 7% are those with conventional labeling. Fresh fruits and vegetables with bio and GMO labeling were not identified in the studied center (Graph 3).

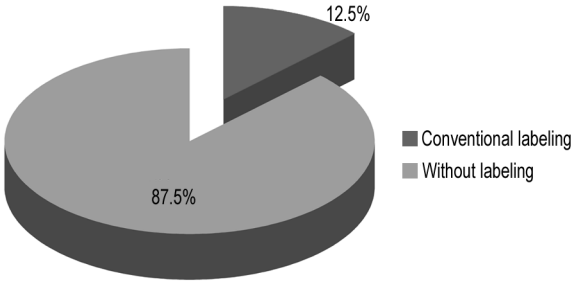
Graph 4 shows the results of the study on the labeling of fresh fruits and vegetables at commercial center D.



Graph 4. Labeling of fresh fruit and vegetables in bulk at a commercial center D
Source: Authors research

The results reflected on graph 4 prove that 85.94% of the fresh fruits and vegetables available in bulk in the studied center D are without labels, 7.81% are with labels for conventional production and 6.25% are with bio labels. Fresh fruits and vegetables were not found with GMO labels in the studied shopping center.

Graph 5 presents the results from the carried out study of the labels of fresh fruits and vegetables in commercial center E.



Graph 5. Labeling of fresh fruit and vegetables in bulk at commercial center E
Source: Authors research

It can be seen from graph 5 that in store E no fresh fruits and vegetables with bio and GMO labels were found. The trend for the highest proportion (87.50%) of fresh fruits and vegetables without labels is maintained, and with conventional labels are 12.50% of the studied fresh fruits and vegetables in bulk.

As a result of the study of the labeling of fresh fruits and vegetables, which are available in bulk in the Bulgarian commercial network it was found that a considerable part of them are unmarked (from 84.49% to 93.33%), followed by those with conventional labeling (from 6.67% to 12.50%) and those with bio labeling (from 2.70% to 6.25%). It was found, from the five commercial centers surveyed on the territory of the country, that there are no available fresh fruits and vegetables with GMO labels, which is evidence that GMOs are not offered to consumers in Bulgaria. There were not found fresh fruits and vegetables with bio labels in two of the examined commercial centers. The reason for this is that organic fresh fruits and vegetables are not offered at these sites.

3. Conclusion

The study of the scientific literature and the regulatory framework revealed that the requirements for the labeling of conventional, organic and GMO fresh fruits and vegetables are laid down in Regulation No 16 of 28 May 2010, Regulation for implementation (EU) No 543/2011 and Regulation (EC) No 1829/2003. These regulatory documents are supported by the Ordinance on the requirements for the labeling and presentation of foods and Regulation (EU) No 1169/2011. The studied and presented regulatory framework is a proof of a developed Bulgarian and Union legislation in the field of labeling of fresh fruits and vegetables.

The conducted study on the labeling of fresh fruits and vegetables offered in bulk in the Bulgarian commercial network revealed that a significant part of them are unmarked, followed by those with conventional and bio labels. The study did not identify fresh fruits and vegetables with GMO labels, since they are not offered to consumers at the commercial centers.

The results obtained are evidence that a considerable part of the fresh fruits and vegetables offered in bulk in the Bulgarian commercial network do not contain optional labels. This is a prerequisite for rethinking the legislative framework for the labels of fresh fruit and vegetables, which would lead to the conversion of the marking from optional to obligatory. This will create conditions for consumers to be better informed when choosing and buying fresh fruits and vegetables in bulk. An interest in future research is the study of consumer awareness of the optional labels of fresh fruits and vegetables.

References

[1] 543/2011 / EU: Commission Implementing Regulation (EU) No 543/2011 of 7 June 2011 laying down detailed rules for the application of Council Regulation (EC) No 1234/2007 as regards in the fields of fruit and vegetables and processed fruits and vegetables (Bg).

[2] Ivanova, D., Vasileva, E., Stefanov, S., Tipova, N. (2012). *Organic Products in Bulgaria*, Guide for Producers. Publishing Complex – UNWE Sofia, pp. 3 – 59 (Bg).

[3] Ordinance on the requirements for food labeling and presentation. Entered into force on 29.07.2001. Adopted by Decree No 136 of 19.07.2000. DV. 62 of July 28, 2000, amend. DV. Issue 40 of April 19, 2002, amend. DV. Issue 19 of February 28, 2003, amend. DV. Issue 100 of November 14, 2003, amend. DV. No.98 of November 5, 2004, amend. DV. Issue 82 of October 14, 2005, amend. DV. Issue 20 of 7 March 2006, amend. DV. 75 of 18 September 2007, amend. DV. Issue 48 of 23 May 2008, amend. DV. No 47 of 22 June 2010, amended. and ext. DV. 42 of 5 June 2012, amend. and ext. DV. issue 84 of 27 September 2013, rev. DV. Issue 102 of December 12, 2014 (Bg).

[4] Ordinance No. 16 of May 28, 2010, on the quality and control requirements for the compliance of fresh fruit and vegetables with effect from 08.06.2010. Issued by the Ministry of Agriculture and Food DV. 43 of 8 June 2010, amend. DV. Issue 71 of 13 September 2011 (Bg).

[5] Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council and repealing Commission Directive 87/250 / EEC, Council Directive 90/496 / EEC, Commission Directive 1999/10 / EC, Directive 2000/13 / EC of the European Parliament and of the Council, Directives 2002 / 67 / EC and 2008/5 / EC of the Commission and Commission Regulation (EC) No 608/2004 (Text with EEA relevance) (Bg).

[6] Regulation (EC) No 1829/2003 of the European Parliament and of the Council of 22 September 2003 on genetically modified food and feed (Text with EEA relevance) (Bg).

[7] Bordeleau, G., Myers-Smith, I., Midak, M., Szeremeta, A. (2002). Food Quality: A comparison of organic and conventional fruits and vegetables. Ecological Agriculture, *Den Kongelige Veterinœrog Landbohøjskole*, pp. 1-81.

[8] International Federation for Produce Standards, http://www.ifpsglobal.com

[9] Kader, A. (2001). Importance of Fruits, Nuts, and Vegetables in Human Nutrition and Health. *Perishables Handling Quarterly*, Issue No. 106, pp. 4-6.

[10] Naveena, B., Immanuel, G. (2017). Effect of Chemical and Natural Agents on Physico-chemical Properties of Fruits and Vegetables. *Advances in Life Sciences,* 6(1), pp. 56-61.

[11] Vasileva, E., Ivanova, D., Tipova, N., Stefanov, S. (2019) Quality of organic foods – a model for comparative analysis, *Organic Agriculture*, 9(1) 1–12 (https://doi.org/10.1007/s13165-018-0211-4; SCOPUS)

[12] Vicente, A. R., Manganaris, G. A., Sozzi, G. O., Crisosto, C. H. (2009). *Nutritional Quality of Fruits and Vegetables. Postharvest Handling: A Systems Approach*, 2nd Edition, edited by W. J. Florkowski, R. L. Shewfelt, B. Brueckner and S. E. Prussia (Elsevier Inc., Academic Press, 2009), pp. 58-106.

[13] Zhang, C., Wohlhueter, R., Zhang, H. (2016). Genetically modified foods: A critical review of their promise and problems. *Food Science and Human Wellness*, Vol. 5, Issue 3, pp. 116-123.

Evaluation of Nutritional and Mineral Content of Wasted Peels from Melon, Watermelon, Aubergine and Squash

Vanya ZHIVKOVA

University of Economics – Varna, blvd "Kniaz Boris I" 77, 9002 Varna, Bulgaria
E-mail: v_jivkova@abv.bg

Abstract

The purpose of the present work was to evaluate the nutritional and mineral content of wasted peels from melon, watermelon, aubergine and squash. Results were obtained for the content of free fat, crude protein, total dietary fibre, digestible carbohydrates, total sugars, reducing sugars, water, dry matter, total ash and fifteen elements: B, Na, Mg, Al, P, S, K, Ca, Cr, Mn, Fe, Cu, Zn, Se, Mo. Analyzes revealed that melon wasted peels had the highest values of digestible carbohydrates (5.8%), total sugars (4.40%), reducing sugars (3.22%), dry matter (9.2%), B (2.10 mg/kg), Na (83.1 mg/kg), Mg (466 mg/kg), Al (3.11 mg/kg) and Ca (720 mg/kg). Watermelon wasted peels were the richest in free fat (0.19%) and water content (92.7%). Squash wasted peels were characterized by the highest values of crude protein (2.04%), total ash (1.12%), P (748 mg/kg), S (213 mg/kg), K (3402 mg/kg), Mn (1.80 mg/kg), Fe (5.59 mg/kg), Cu (1.52 mg/kg) along with the aubergine wasted peels, Zn (3.19 mgkg) and Mo (0.38 mg/kg); and aubergine wasted peels were the richest in total dietary fibre (5.19%). Squash and melon wasted peels were characterized by the same values of free fat (0.09%); aubergine and watermelon wasted peels – by the same values of reducing sugars (1.40%); squash and watermelon wasted peels – by the same values of B (1.51 mg/kg); aubergine and squash wasted peels – by the same values of Cu (1.52 mg/kg).

Keywords: *melon wasted peels; watermelon wasted peels; aubergine wasted peels; squash wasted peels; nutritional content; mineral content.*

1. Introduction

The utilization of food-processing by-products and wastes, as well as underutilized agricultural products is of high importance (Saavedra et al. 2015). Vegetable wastes as a part of agricultural waste are highly perishable and they are produced in large quantities (Patil & Deshmukh, 2016). Peels are the major by-products obtained during the fruit processing (Maniyan, John & Mathew, 2015). Vegetable market wastes contribute to a great amount of pollution and cause serious environmental and health risks (Dhanalakshmi Sridevi & Ramanujam, 2012a, 2012b).

Vella, Cautela & Laratta (2019) characterized polyphenolic compounds in cantaloupe melon by-products (peels and seeds), which are non-edible parts of the melon. Melon (*Cucumis melo* L.) by-products (seeds and peel) are a potential source of natural food ingredients; melon peel is a good source of minerals: K, Na, Mg, Ca (Silva et al. 2020). Sabino et al. (2015) determinated the bioactive compounds, the antioxidant activity and the minerals in the flours produced with mango, papaya, melon and pineapple fruit peels. Sabino et al. (2015) found that in melon peel flour, potassium had the highest content. Maniyan, John & Mathew (2015) investigated the peels of different fruits including muskmelon for some nutritional and anti-nutritional components. According to Petkowicz, Vriesmann & Williams (2017), fresh or dried watermelon rinds were suitable for the recovery of pectin. Souad, Jamal & Olorunnisola (2012) prepared jam from watermelon waste (rind only) and investigated the physicochemical properties and sensory characteristics of the jam. According to Naknaen et al. (2016), watermelon rind powder could be utilized for the production of cookies with improved properties. According to Nguyen et al. (2019), watermelon rind powder (an agricultural waste product) could be a natural source of L-citrulline in chicks. Chaudhari & Singhal (2015) evaluated cutin from nonedible watermelon peel waste for cutinase production. Chidan Kumar, Mythily & Chandraju (2012) explored the extraction of sugars from watermelon (*Citrullus lanatus*) peels. Lakshmipathy & Sarada (2013) investigated the sorption of nickel and cobalt onto watermelon rind from aqueous solution. Wadgaonkar et al. (2018) analyzed the mechanical properties of carbonized watermelon rind filler reinforced unsaturated polyester composite. According to Lam et al. (2016), fruit wastes, including watermelon peels, can be a feedstock for pyrolysis conversion into bio-oil, bio-gas, and biochar. The results obtained by Lucas-Torres et al. (2016) highlighted the opportunities for the conversion of melon rind waste into a source of biofuel precursors. Amekan et al. (2018) investigated the effect of inoculum from different biogas digesters, one of which melon fruit waste, to the biohydrogen production.

Aubergine (*Solanum melongena* L.) is otherwise known as eggplant or brinjal (Nisha, Abdul Nazar & Jayamurthy, 2009; Sultana et al. 2013; Niño-Medina et al. 2017). Eggplant peel is a valuable source of ascorbic acid and phenolics (Kadivec et al. 2015). Sadilova, Stintzing & Carle (2006) investigated the anthocyanin patterns of eggplant and violet pepper peels, their colour qualities and antioxidant capacities. Todaro et al. (2009) developed an inexpensive method for anthocyanin extraction and recovery from eggplant peel. Nisha, Abdul Nazar & Jayamurthy (2009) evaluated and compared preliminarily the antioxidant activity of different varieties of eggplant. The work by Babu & Venkatesh (2009) demonstrated that eggplant is a multiallergenic vegetable. The authors Babu & Venkatesh (2009) established presence of allergens in all edible parts of eggplant, predominant in the peel. Sultana et al. (2013) studied polyphenols, metal helating and free radical scavenging potential of

extracts of different parts (peel, flesh, green crown) of aubergine (*Solanum melongena* L.).

Gallo, Naviglio & Ferrara (2014) proposed a fast, efficient and economical method for extracting of natural dye nasunin from eggplant peels as waste products from the food industry. Kadivec et al. (2015) determined the content of ascorbic acid and phenolic compounds of eggplant flesh and peel. Patil & Deshmukh (2016) optimized process parameters for biomethanation of vegetable waste, one component of it is brinjal (*Solanum melongena* L.). Dranca & Oroian (2016) extracted total monomeric anthocyanin and total phenolic content from eggplant peel using ultrasonic treatments. Lo Scalzo et al. (2016) studied the cooking-induced changes in the eggplant phytochemicals before and after grilling and boiling. Braga et al. (2016) compared and characterized for antioxidant activity eggplant peels containing glycosides.

In their review, Niño-Medina et al. (2017) focused in the analysis of the structure and content of phenolics in eggplant. Ferarsa et al. (2018) used conventional extraction, grinding process and ultrasound-assisted extraction in order to enhance the extraction efficiency of anthocyanins and other phenolic compounds from purple eggplant peels and pulps. Capello et al. (2019) studied the adsorption/desorption properties of anthocyanins extracted from eggplant peels on the surface of synthetic layered silicate. Toledo et al. (2019) evaluated the feasibility of co-composting sewage sludge with eggplant waste.

Sagagi, Garba & Usman (2009) carried out comparative studies on biogas production from different fruit and vegetable waste (pineapple, orange, spinach, pumpkin) using cow dung as control. Madhumithah et al. (2011) evaluated the utilization of vegetable wastes, among which pumpkin and brinjal wastes, for the production of protease by *Aspergillus niger*. Saavedra et al. (2015) showed that squash pumpkin shell and seeds as agro-food industrial residues are potentially good sources of compounds with antioxidant properties like polyphenols. Hossain et al. (2015) studied the chemical composition of different vegetable peels, among which brinjal peel and pumpkin peel, as potential unconventional livestock feeds. Dubrovskis & Plume (2017) investigated the potential of biogas production from vegetable and fruit waste biomass such as non-standard pumpkins, marrows, apples.

The aim of the present paper is to evaluate the nutritional and mineral content of wasted peels from melon, watermelon, aubergine and squash.

2. Materials and Methods

In this research, melon, watermelon, aubergine and squash wasted peels were used as experimental material. The samples were purchased from the local market and were tested in the SGS Bulgaria Ltd, Laboratory Varna, for the following indicators: free fat, crude protein, total dietary fibre, digestible carbohydrates, total sugars, reducing sugars, water content, dry matter, total ash, mineral content. Methodologies described in details could be found in the work by Baloch, Xia & Sheikh (2015).

3. Results and Discussion

Nutritional content of melon, watermelon, aubergine and squash wasted peels studied in this paper were presented in Table 1.

Parameter, %	Melon wasted peels	Watermelon wasted peels	Aubergine wasted peels	Squash wasted peels
Free fat	0.09 ± 0.01	0.19 ± 0.01	<0.01	0.09 ± 0.01
Crude protein	0.93 ± 0.15	1.22 ± 0.15	0.95 ± 0.15	2.04 ± 0.15
Total dietary fibre	1.64 ± 0.20	2.56 ± 0.26	5.19 ± 0.50	0.67 ± 0.13
Digestible carbohydrates	5.8 ± 1.2	2.6 ± 0.5	2.4 ± 0.5	4.8 ± 1.0
Total sugars	4.40 ± 0.25	1.54 ± 0.25	1.56 ± 0.25	2.66 ± 0.25
Reducing sugars	3.22 ± 0.25	1.40 ± 0.25	1.40 ± 0.25	2.51 ± 0.25
Water content	90.9 ± 0.3	92.7 ± 0.3	91.0 ± 0.3	91.3 ± 0.3
Dry matter	9.2 ± 0.3	7.4 ± 0.3	9.1 ± 0.3	8.7 ± 0.3
Total ash	0.62 ± 0.02	0.72 ± 0.02	0.48 ± 0.01	1.12 ± 0.03

Table 1. Nutritional content of melon, watermelon, aubergine and squash wasted peels

According to Table 1, the content of parameters free fat, crude protein, total dietary fibre, digestible carbohydrates, total sugars and reducing sugars decreased in the following order:

- in melon wasted peels: digestible carbohydrates>total sugars>reducing sugars>total dietary fibre>crude protein >free fat;
- in watermelon wasted peels: digestible carbohydrates >total dietary fibre>total sugars>reducing sugars>crude protein>free fat;
- in aubergine wasted peels: total dietary fibre>digestible carbohydrates>total sugars>reducing sugars>crude protein>free fat;
- in squash wasted peels: digestible carbohydrates>total sugars>reducing sugars>crude protein>total dietary fibre >free fat.

Squash and melon wasted peels had the same values for free fat content (0.09%). Watermelon wasted peels were the highest in free fat content (0.19%), and the free fat in aubergine wasted peels was below 0.01%. Squash wasted peels were the richest in crude protein content (2.04%), followed by watermelon wasted peels (1.22%), aubergine wasted peels (0.95%) and melon wasted peels (0.93%). The richest in total dietary fibre were aubergine wasted peels (5.19%), which was about twice as high as total dietary fibre content in watermelon wasted peels (2.56%), three times as much as melon wasted peels (1.64%) and just over seven times higher than in squash wasted peels (0.67%). Melon wasted peels were the richest in digestible carbohydrates (5.8%), followed by squash wasted peels (4.8%), watermelon wasted peels (2.6%) and aubergine wasted peels (2.4%). Melon wasted peels were also the richest in total sugars (4.40%), followed by squash wasted peels (2.66%), aubergine wasted peels (1.56%) and watermelon wasted peels (1.54%). Aubergine and watermelon wasted peels had the same value of reducing sugars content (1.40%). The both wastes also had similar values for digestible carbohydrates and total sugars. The reducing sugars were the highest in melon wasted peels (3.22%) and then in squash wasted peels (2.51%). Watermelon wasted peels were the richest in water content (92.7%), and melon wasted peels had the lowest water content (90.9%). Aubergine and squash wasted peels had very similar values for water content (91.0% and 91.3%, respectively). Wasted peels from melon and aubergine had the highest dry matter content (9.2% and 9.1%, respectively), followed by squash wasted peels (8.7%) and watermelon wasted peels (7.4%). Squash wasted peels contained the largest amount of total ash (1.12%), followed by wasted peels from watermelon (0.72%), melon (0.62%) and aubergine (0.48%).

The results on the mineral composition of the melon, watermelon, aubergine and squash wasted peels researched in this work were presented in Table 2.

Parameter, mg/kg	Melon wasted peels	Watermelon wasted peels	Aubergine wasted peels	Squash wasted peels
B	2.10 ± 10 rel.%	1.51 ± 10 rel.%	1.80 ± 10 rel.%	1.51 ± 10 rel.%
Na	83.1 ± 10 rel.%	3.19 ± 10 rel.%	19.3 ± 10 rel.%	2.96 ± 10 rel.%
Mg	466 ± 5 rel.%	263 ± 5 rel.%	158 ± 5 rel.%	414 ± 5 rel.%
Al	3.11 ± 10 rel.%	1.35 ± 10 rel.%	1.80 ± 10 rel.%	0.94 ± 15 rel.%
P	355 ± 5 rel.%	520 ± 5 rel.%	199 ± 5 rel.%	748 ± 5 rel.%
S	174 ± 5 rel.%	162 ± 5 rel.%	140 ± 5 rel.%	213 ± 5 rel.%
K	1358 ± 5 rel.%	2096 ± 5 rel.%	2890 ± 5 rel.%	3402 ± 5 rel.%
Ca	720 ± 5 rel.%	285 ± 5 rel.%	217 ± 5 rel.%	526 ± 5 rel.%
Cr	<0.05	<0.05	<0.05	<0.05
Mn	1.09 ± 10 rel.%	1.22 ± 10 rel.%	1.24 ± 10 rel.%	1.80 ± 10 rel.%
Fe	4.21 ± 10 rel.%	3.51 ± 10 rel.%	3.98 ± 10 rel.%	5.59 ± 10 rel.%
Cu	0.68 ± 15 rel.%	0.84 ± 15 rel.%	1.52 ± 10 rel.%	1.52 ± 10 rel.%
Zn	0.99 ± 15 rel.%	1.70 ± 10 rel.%	0.98 ± 15 rel.%	3.19 ± 10 rel.%
Se	<0.05	<0.05	<0.05	<0.05
Mo	<0.05	<0.05	<0.05	0.38 ± 15 rel.%

Table 2. Mineral composition of melon, watermelon, aubergine and squash wasted peels

When analyzing the results, it should be noted that the chemical element potassium is present in the highest amount. Squash wasted peels were the richest in K (3402 mg/kg), followed by wasted peels from aubergine (2890 mg/kg), watermelon (2096 mg/kg) and melon (1358 mg/kg). In addition to potassium, squash wasted peels were also the richest in P (748 mg/kg), S (213 mg/kg), Mn (1.80 mg/kg), Fe (5.59 mg/kg), Cu (1.52 mg/kg) along with the aubergine wasted peels, Zn (3.19 mg/kg) and Mo (0.38 mg/kg). In the other three samples tested, molybdenum was below the detectable minimum (<0.05 mg/kg). Melon wasted peels had the highest values of B (2.10 mg/kg), Na (83.1 mg/kg), Mg (466 mg/kg), Al (3.11 mg/kg) and Ca (720 mg/kg). Wasted peels from squash and watermelon were characterized by the same values of B (1.51 mg/kg). Second in terms of boron content after the melon wasted peels were the aubergine wasted peels (1.80 mg/kg). Aubergine wasted peels also came second after melon wasted peels in sodium content (19.3 mg/kg), followed by wasted peels from watermelon (3.19 mg/kg) and squash (2.96 mg/kg). In magnesium content, after the melon wasted peels were squash wasted peels (414 mg/kg), followed by wasted peels from watermelon (263 mg/kg) and aubergine (158 mg/kg). In terms of aluminum content, second after melon wasted peels, were ranked aubergine wasted peels (1.80 mg/kg), followed by watermelon wasted peels (1.35 mg/kg) and squash wasted peels (0.94 mg/kg). Watermelon wasted peels came second after squash wasted peels in phosphorus content (520 mg/kg), followed by wasted peels from melon (355 mg/kg) and aubergine (199 mg/kg). Secondly after the squash wasted peels by sulfur content were melon wasted peels (174 mg/kg), followed by watermelon wasted peels (162 mg/kg) and aubergine wasted peels (140 mg/kg). In terms of calcium content, second after melon wasted peels, were ranked squash wasted peels (526 mg/kg), followed by wasted peels from watermelon (285 mg/kg) and aubergine (217 mg/kg). In all samples tested, the elements chromium and selenium were in quantities below the detectable minimum (<0.05 mg/kg). Wasted peels from aubergine and watermelon had little difference in the amount of manganese (1.24 mg/kg and 1.22 mg/kg, respectively). The lowest was the content of manganese in the melon wasted peels (1.09 mg/kg). Secondly after squash wasted peels by Fe content were melon wasted peels (4.21 mg/kg), followed by wasted peels from aubergine (3.98 mg/kg) and watermelon (3.51 mg/kg). In terms of Cu content, after aubergine and squash wasted peels, were ranked watermelon wasted peels (0.84 mg/kg) and melon wasted peels (0.68 mg/kg). Wasted peels from aubergine and melon had very similar values of zinc content (0.98 mg/kg and 0.99 mg/kg, respectively). After squash wasted peels, second in terms of zinc content were watermelon wasted peels (1.70 mg/kg).

In the works by Dhanalakshmi Sridevi & Ramanujam (2012a, 2012b) data can be found for moisture content, carbohydrate, fat, protein of brinjal waste. According to Al-Sayed & Ahmed (2013), watermelon rinds and sharlyn melon peels are good sources of phenolic compounds and dietary fibre. Al-Sayed & Ahmed (2013) evaluated some physical and chemical properties of watermelon rind and sharlyn melon peel powders and its utilization as a natural source of dietary fibre and antioxidants in cake. In the work by Al-Sayed & Ahmed (2013) can be found values for proximate composition of watermelon rind and sharlyn melon peel powders. In the work by Hossain et al. (2015) were determined dry matter, crude protein, crude fibre, ash and some other parameters of vegetable peels, among which brinjal peel and pumpkin peel. In the work by El-Badry et al. (2014) can be found values for chemical composition of watermelon rind powders. Romelle, Rani & Manohar (2016) obtained results for the proximate composition of watermelon peels. Mohan, Shanmugam & Nithyalakshmi (2016) obtained results for the carbohydrate content, moisture, fat, protein and ash content of fresh watermelon rind. According to Mallek-Ayadi, Bahloul & Kechaou (2017), the melon peel could be considered as a rich source of carbohydrates, proteins, Ca, K, polyphenols. In the work by Mallek-Ayadi, Bahloul & Kechaou (2017) can be found values for moisture content, protein content, fat content, ash content, carbohydrates content and total dietary fibre content of melon peels. Romdhane et al. (2017) characterized polysaccharides from watermelon rinds and assessed their antioxidant, antihypertensive and functional properties. The value we obtained for water content in watermelon wasted peels (92.7%) was the closest to the moisture content (92.6%) of watermelon raw peel obtained by Morais et al. (2017). In the work by Olayinka & Etejere (2018) can be found results for moisture content, ash content, fibre content, protein content, fat content and carbohydrates content of watermelon rind. Nguyen et al. (2019) obtained results for the chemical composition of watermelon rind powder.

According to Asquer, Pistis & Scano (2013), potassium is the highest element in aubergine, melon and watermelon waste, which confirms our results for the highest potassium content in all wasted peels (Table 2). Asquer, Pistis & Scano (2013) found that the first four minerals in the watermelon wastes, sorted by decreasing amount, were as follows: K>Al>Mg>Ca, in the melon wastes: K>Ca>Mg>Al, and in the aubergine wastes: K>Al>Ca>Mg. According to Gav et al. (2019), concentrations of metals in the watermelon bark decreased in the following order: Ca>Mg>Fe>Cr. The mineral content of the watermelon peel examined by Gladvin et al. (2017) decreased in the following order: P>Ca>Na>Mg>Mn>K>Fe=Zn>Cu. The results we have obtained confirmed the results obtained by Kuppusamy, Venkateswarlu & Megharaj (2017) for the arrangement of the first three macroelements with the highest content in watermelon rind: K>P>Ca. According to Mallek-Ayadi, Bahloul & Kechaou (2017), the first four elements with the highest content of melon peels were: Ca>K>Mg>Na. The

results obtained by Romelle, Rani & Manohar (2016) for the mineral composition of watermelon peels showed that the content of minerals decreased in the following order: Fe > Ca > Zn > Mn. According to Olayinka & Etejere (2018), the highest content of the watermelon rind had Fe, followed by K, Mg, Ca, Na, Zn.

4. Conclusions

The nutritional composition examination found that free fat and water content had the highest values in watermelon wasted peels (0.19% and 92.7%, respectively); crude protein and total ash – in squash wasted peels (2.04% and 1.12%, respectively); total dietary fibre – in aubergine wasted peels (5.19%); digestible carbohydrates, total sugars, reducing sugars and dry matter – in melon wasted peels (5.8%, 4.40%, 3.22% and 9.2%, respectively). The mineral content examination found that all samples tested had the highest potassium content. Squash wasted peels were the richest in K (3402 mg/kg), followed by aubergine wasted peels (2890 mg/kg), watermelon wasted peels (2096 mg/kg) and melon wasted peels (1358 mg/kg). In addition to potassium, squash wasted peels were also the richest in P (748 mg/kg), S (213 mg/kg), Mn (1.80 mg/kg), Fe (5.59 mg/kg), Cu (1.52 mg/kg) along with the aubergine wasted peels, Zn (3.19 mg/kg) and Mo (0.38 mg/kg). In the other samples tested, Mo was in quantities below the detectable minimum (< 0.05 mg/kg). In all samples tested, Cr and Se were below the detectable minimum. Melon wasted peels had the highest values of B (2.10 mg/kg), Na (83.1 mg/kg), Mg (466 mg/kg), Al (3.11 mg/kg) and Ca (720 mg/kg).

References

[1] Al-Sayed, H.M.A., & Ahmed, A.R. (2013). Utilization of watermelon rinds and sharlyn melon peels as a natural source of dietary fiber and antioxidants in cake. *Annals of Agricultural Science*, 58(1), 83-95.

[2] Amekan, Y., Wangi, D.S.A.P., Cahyanto, M.N., Sarto, & Widada, J. (2018). Effect of different inoculum combination on biohydrogen production from melon fruit waste. *International Journal of Renewable Energy Development*, 7(2), 101-109.

[3] Asquer, C., Pistis, A., Scano, E.A. (2013). Characterization of fruit and vegetable wastes as a single substrate for the anaerobic digestion. *Environmental Engineering and Management Journal*, 12(S11), 89-92.

[4] Babu, B.N.H., & Venkatesh, Y.P. (2009). Clinico-immunological analysis of eggplant (Solanum melongena) allergy indicates preponderance of allergens in the peel. *World Allergy Organization Journal*, 2, 192-200.

[5] Baloch, A.B., Xia, X., & Sheikh, S.A. (2015). Proximate and mineral compositions of dried cauliflower (Brassica Oleracea L.) grown in Sindh, Pakistan. *Journal of Food and Nutrition Research*, 3(3), 213-219.

[6] Braga, P.C., Lo Scalzo, R., Dal Sasso, M., Lattuada, N., Greco, V., & Fibiani, M. (2016). Characterization and antioxidant activity of semi-purified extracts and pure delphinidin-glycosides from eggplant peel (Solanum melongena L.). *Journal of Functional Foods*, 20, 411-421.

[7] Capello, C., Leandro, G.C., Campos, C.E.M., Hotza, D., Carciofi, B.A.M., & Ayala Valencia, G. (2019). Adsorption and desorption of eggplant peel anthocyanins on a synthetic layered silicate. *Journal of Food Engineering*, 262, 162-169.

[8] Chaudhari, S.A., & Singhal, R.S. (2015). Cutin from watermelon peels: A novel inducer for cutinase production and its physicochemical characterization. *International Journal of Biological Macromolecules*, 79, 398-404.

[9] Chidan Kumar, C.S., Mythily, R., & Chandraju, S. (2012). Studies on sugars extracted from water melon (Citrullus lanatus) rind, a remedy for related waste and its management. *International Journal of Chemical and Analytical Science*, 3(8), 1527-1529.

[10] Dhanalakshmi Sridevi, V., & Ramanujam, R.A. (2012a). Biogas generation in a vegetable waste anaerobic digester: An analytical approach. *Research Journal of Recent Sciences*, 1(3), 41-47.

[11] Dhanalakshmi Sridevi, V., & Ramanujam, R.A. (2012b). Performance of mixture of vegetable wastes with high carbohydrate content in anaerobic digestion process. *International Journal of Environmental Sciences*, 3(1), 181-191.

[12] Dranca, F., & Oroian, M. (2016). Optimization of ultrasound-assisted extraction of total monomeric anthocyanin (TMA) and total phenolic content (TPC) from eggplant (Solanum melongena L.) peel. *Ultrasonics Sonochemistry*, 31, 637-646.

[13] Dubrovskis, V., & Plume, I. (2017). Biogas from wastes of pumpkin, marrow and apple. *Agronomy Research*, 15(1), 069-078.

[14] El-Badry, N., El-Waseif, M.A., Badr, S.A., & Ali, H.E. (2014). Effect of addition watermelon rind powder on the rheological, physiochemical and sensory quality attributes of pan bread. *Middle East Journal of Applied Sciences*, 4(4), 1051-1064.

[15] Ferarsa, S., Zhang, W., Moulai-Mostefa, N., Ding, L., Jaffrin, M.Y., & Grimi, N. (2018). Recovery of anthocyanins and other phenolic compounds from purple eggplant peels and pulps using ultrasonic-assisted extraction. *Food and Bioproducts Processing*, 109, 19-28.

[16] Gallo, M., Naviglio, D., & Ferrara, L. (2014). Nasunin, an antioxidant anthocyanin from eggplant peels, as natural dye to avoid food allergies and intolerances. *European Scientific Journal*, 10(9), 1-11.

[17] Gav, B.L, Anyanwu, S.N., Oloruntoba, S.O., Tor. P. (2019). Proximate and mineral analysis of watermelon sold at North Bank Market, Makurdi, Nigeria. *Global Journal of Science Frontier Research: B Chemistry*, 19(1), 35-40.

[18] Gladvin, G., Sudhaakr, G., Swathi, V., Santhisri, K.V. (2017). Mineral and vitamin compositions contents in watermelon peel (rind). *International Journal of Current Microbiology and Applied Sciences*, Special Issue-5, 129-133.

[19] Hossain, M.E., Sultana, S.A., Karim, M.H., & Ahmed, M.I. (2015). Vegetable peels: a promising feed resource for livestock. *Online Journal of Animal and Feed Research*, 5(1), 33-39.

[20] Kadivec, M., Kopjar, M., Žnidarčič, D., & Požrl, T. (2015). Potential of eggplant peel as by-product. *Acta Alimentaria*, 44(1), 126-131.

[21] Kuppusamy, S., Venkateswarlu, K., Megharaj, M. (2017). Evaluation of nineteen food wastes for essential and toxic elements. *International Journal of Recycling of Organic Waste in Agriculture*, 6, 367-373.

[22] Lakshmipathy, R., & Sarada, N.C. (2013). Application of watermelon rind as sorbent for removal of nickel and cobalt from aqueous solution. *International Journal of Mineral Processing*, 122, 63-65.

[23] Lam, S.S., Liew, R.K., Lim, X.Y., Ani, F.N., & Jusoh, A. (2016). Fruit waste as feedstock for recovery by pyrolysis technique. *International Biodeterioration & Biodegradation*, 113, 325-333.

[24] Lo Scalzo, R., Fibiani, M., Francese, G., D'Alessandro, A., Rotino, G.L., Conte, P., & Mennella, G. (2016). Cooking influence on physico-chemical fruit characteristics of eggplant (Solanum melongena L.). *Food Chemistry*, 194, 835-842.

[25] Lucas-Torres, C., Lorente, A., Cabañas, B., & Moreno, A. (2016). Microwave heating for the catalytic conversion of melon rind waste into biofuel precursors. *Journal of Cleaner Production*, 138, 59-69.

[26] Madhumithah, C.G., Krithiga, R., Sundaram, S., Sasikumar, C.S., Guhathakurta, S., & Cherian, K.M. (2011). Utilization of vegetable wastes for production of protease by solid state fermentation using Aspergillus niger. *World Journal of Agricultural Sciences*, 7(5), 550-555.

[27] Mallek-Ayadi, S., Bahloul, N., & Kechaou, N. (2017). Characterization, phenolic compounds and functional properties of Cucumis melo L. peels. *Food Chemistry*, 221, 1691-1697.

[28] Maniyan, A., John, R., & Mathew, A. (2015). Evaluation of fruit peels for some selected nutritional and anti-nutritional factors. *Emergent Life Sciences Research*, 1(2), 13-19.

[29] Mohan, A., Shanmugam, S., & Nithyalakshmi, V. (2016). Comparison of the nutritional, physico-chemical and anti-nutrient properties of freeze and hot air dried watermelon (Citrullus lanatus) rind. *Biosciences Biotechnology Research Asia*, 13(2), 1113-1119.

[30] Morais, D.R., Rotta, E.M., Sargi, S.C., Bonafe, E.G., Suzuki, R.M., Souza, N.E., Matsushita, M., & Visentainer, J.V. (2017). Proximate composition, mineral contents and fatty acid composition of the different parts and dried peels of tropical fruits cultivated in Brazil. *Journal of the Brazilian Chemical Society*, 28(2), 308-318.

[31] Naknaen, P., Itthisoponkul, T., Sondee, A., & Angsombat, N. (2016). Utilization of watermelon rind waste as a potential source of dietary fiber to improve health promoting properties and reduce glycemic index for cookie making. *Food Science and Biotechnology*, 25(2), 415-424.
[32] Nguyen, L.T.N., Han, G., Yang, H., Ikeda, H., Eltahan, H.M., Chowdhury, V.S., & Furuse, M. (2019). Dried watermelon rind mash diet increases plasma L-citrulline level in chicks. *Journal of Poultry Science*, 56(1), 65-70.
[33] Niño-Medina, G., Urías-Orona, V., Muy-Rangel, M.D., & Heredia, J.B. (2017). Structure and content of phenolics in eggplant (Solanum melongena) – A review. *South African Journal of Botany*, 111, 161-169.
[34] Nisha, P., Abdul Nazar, P., & Jayamurthy, P. (2009). A comparative study on antioxidant activities of different varieties of Solanum melongena. *Food and Chemical Toxicology*, 47, 2640-2644.
[35] Olayinka, B.U., & Etejere, E.O. (2018). Proximate and chemical compositions of watermelon (Citrullus lanatus (Thunb.) Matsum and Nakai cv Red and cucumber (Cucumis sativus L. cv Pipino). *International Food Research Journal*, 25(3), 1060-1066.
[36] Patil, V.S., & Deshmukh, H.V. (2016). Optimization of process parameters for biomethanation of vegetable wastes. *Journal of Environmental Research and Development*, 11(01), 117-122.
[37] Petkowicz, C.L.O., Vriesmann, L.C., & Williams, P.A. (2017). Pectins from food waste: Extraction, characterization and properties of watermelon rind pectin. *Food Hydrocolloids*, 65, 57-67.
[38] Romdhane, M.B., Haddar, A., Ghazala, I., Jeddou, K.B., Helbert, C.B., & Ellouz-Chaabouni, S. (2017). Optimization of polysaccharides extraction from watermelon rinds: Structure, functional and biological activities. *Food Chemistry*, 216, 355-364.
[39] Romelle, F.D., Rani, P.A., & Manohar, R.S. (2016). Chemical composition of some selected fruit peels. *European Journal of Food Science and Technology*, 4(4), 12-21.
[40] Saavedra, M.J., Aires, A., Dias, C., Almeida, J.A., De Vasconcelos, M.C.B.M., Santos, P., & Rosa, E.A. (2015). Evaluation of the potential of squash pumpkin by-products (seeds and shell) as sources of antioxidant and bioactive compounds. *Journal of Food Science and Technology*, 52(2), 1008-1015.
[41] Sabino, L.B.S., Gonzaga, M.L.C., Soares, D.J., Lima, A.C.S., Lima, J.S.S., Almeida, M.M.B., Sousa, P.H.M., Figueiredo, R.W. (2015). Bioactive compounds, antioxidant activity, and minerals in flours prepared with tropical fruit peels. *Acta Alimentaria*, 44(4), 520-526.
[42] Sadilova, E., Stintzing, F.C., & Carle, R. (2006). Anthocyanins, colour and antioxidant properties of eggplant (Solanum melongena L.) and violet pepper (Capsicum annuum L.) peel extracts. *Zeitschrift fur Naturforschung C*, 61(7-8), 527-535.
[43] Sagagi, B.S., Garba, B., & Usman, N.S. (2009). Studies on biogas production from fruits and vegetable waste. *Bayero Journal of Pure and Applied Sciences*, 2(1), 115-118.
[44] Silva, M.A., Albuquerque, T.G., Alves, R.C., Oliveira, M.B.P.P., Costa, H.S. (2020). Melon (Cucumis melo L.) by-products: Potential food ingredients for novel functional foods? *Trends in Food Science & Technology*, 98, 181-189.
[45] Souad, A.M., Jamal, P., & Olorunnisola, K.S. (2012). Effective jam preparations from watermelon waste. *International Food Research Journal*, 19(4), 1545-1549.
[46] Sultana, B., Hussain, Z., Hameed, M., & Mushtaq, M. (2013). Antioxidant activity among different parts of aubergine (Solanum melongena L.). *Pakistan Journal of Botany*, 45(4), 1443-1448.
[47] Todaro, A., Cimino, F., Rapisarda, P., Catalano, A.E., Barbagallo, R.N., & Spagna, G. (2009). Recovery of anthocyanins from eggplant peel. *Food Chemistry*, 114, 434-439.
[48] Toledo, M., Márquez, P., Siles, J.A., Chica, A.F., & Martín, M.A. (2019). Co-composting of sewage sludge and eggplant waste at full scale: Feasibility study to valorize eggplant waste and minimize the odoriferous impact of sewage sludge. *Journal of Environmental Management*, 247, 205-213.
[49] Vella, F.M., Cautela, D., & Laratta, B. (2019). Characterization of polyphenolic compounds in cantaloupe melon by-products. *Foods*, 8, 196.
[50] Wadgaonkar, K.K., Mehta, L.B., Bamane, P.B., Kumar, R.P., & Jagtap, R.N. (2018). Effect of carbonized watermelon rind powder on the mechanical and thermal properties of unsaturated polyester composites: A special insight to chemical resistance and value addition. *Advances in Polymer Technology*, 37, 3421-3431.

Modelling Middle Class Consumers Purchase Intention towards Organic Food: An Insight from Indonesia

Mukhamad NAJIB [1*], Ujang SUMARWAN [2], Stevia SEPTIANI [3], Farah FAHMA [4]

[1,3]Department of Management, IPB University, Indonesia
[2]Department of Family and Consumer Science, IPB University, Indonesia
[4]Department of Agroindustrial Technology, IPB University, Indonesia
[*]Corresponding author: E-mail: najib@apps.ipb.ac.id

Abstract

Organic food possesses positive benefits for both the environment (balance) and local farmers (enhancing competitiveness) in Indonesia. Nevertheless, to date, the level of organic food consumption as eco-friendly food in Indonesia is still limited. The present research aimed to provide significant contributions through the evaluation of factors affecting the intention to purchase of organic food in developing country context. It was conducted in five major Indonesian cities and involved 400 respondents (as the research samples). The determination of sampling criteria used the purposive sampling where the potential respondents were in the middle-class groups. The descriptive analysis and Structural Equation Modelling (SEM) analysis were employed to measure the influence of the consumer`s perception and preference on purchase intention regarding organic food. The result of SEM analysis indicated that the intention to purchase of organic food are significantly determined by consumer perceptions and consumer preferences. The implications of this research provide important guidance for policy interventions and marketing decisions aimed at sustaining economic growth in organic food industries.

Keywords: *Indonesia; structural equation modelling; perception; preference.*

1. Introduction

A significant challenge in this century remains the realization of environmental sustainability in the global food system, and one alternative in maintaining the natural balance and sustainable food consumption is through organic farming. The consumption of organic food is one of the key factors of realistic consumption which purposes to reduce environmental humiliation due to extreme exploitation of natural resources. That is why organic food can be considered as eco-friendly food (Sazvar et al., 2018). Furthermore, organic farming not only provides the environmental protection but also improves the public health, conveying substantial benefits to the economy as well as the rural social cohesion (Annunziata and Vecchio, 2016).

Consumers in various countries are beginning to recognize the importance of environmental conservation through the organic food consumption as eco-friendly food. According to Dangelico and Vocalelli (2017), the growing interest to organic food happens among producers and customers. The organic food markets are proliferating in developed countries such as countries in the European Union (Chen, 2007). The consumers in developed countries believe that organic food is proven to be healthier than conventional food, where organic food is believed to contain no harmful ingredients. Based on the characteristics of the organic food itself (that does not use chemicals or other hazardous ingredients in the production process), the selection of organic food as eco-friendly food by consumers in developed countries can be considered as rational decisions (Chen, 2007).

However, although it has increased in terms of size and popularity over the previous few decades, the market share of organic food is still around 1% compared to that of the food products (produced using the chemicals or conventional) (Willer and Kilcher, 2011). Therefore, it is imperative to analyze the determinants of consumer's purchase intention towards organic food (Sazvar et al., 2018).

The selection of food by consumers is a complex process involving both physical (taste, smell, texture) and non-physical aspects of the food, such as the socio-cultural factors, the personality, and the perception. Several studies have shown that different perceptions and preferences of consumers also influence consumer behavior towards organic products (Pham et al., 2019; Rana and Paul, 2017). Additionally, Pandey et al. (2019) mentioned that there is positive correlation between preferences and consumer's intention towards organic food product.

However, they also reported inconsistent findings of factors affecting the behavior of consumer related to organic food consumption. For example, von Meyer-Höfer et al. (2015) concluded that German consumers' attitudes towards organic food is affected by taste and health aspects, while such influence is not apparent among Chilean consumers. Moreover, given that a lot of research reports the Western and developed countries' perspective, a shortage of understanding exists on consumption of organic food in developing countries (Paul and Rana, 2012; von MeyerHöfer et al., 2015). With a variety of characteristics existing between developed and developing countries, the process of selecting food products will also differ among consumers in developed and developing countries, such as Indonesia.

Based on a more strategic perspective, organic food production can help efforts in reaching food security, particularly food safety in Indonesia. This attempt can be made through an even distribution of organic food products within communities. To date, however, the organic food consumption in Indonesia is quiet minimal. The growth of organic food in the national food market is only 5% per year, with a sales value of around 10 billion rupiahs (Indonesia Organic, 2014). Despite being very popular, organic food is still not a product consumed routinely for most people.

Furthermore, most Indonesian consumers do not usually consume organic food. This aspect is most likely due to the perception and preferences of consumers themselves towards the organic products that are still not following the characteristics of the actual organic products. As mentioned by Zander et al. (2018), the low level of purchase of organic food can be attributed to the lack of information, knowledge, credibility, and trust, and along with the perception of the high prices of organic food.

An appropriate marketing strategy based on knowledge on consumer behavior is needed to improve the consumption of organic food by Indonesian people, especially perception mapping, preferences, and purchase intention. Therefore, the objectives of this study is to analyze the relationship among consumer perceptions, preference and purchase intention towards organic food. The contribution of this study is the development of a model of consumers' purchase intention towards organic food as eco-friendly food in developing countries context.

2. Materials and Methods

2.1. Hypothesis Development

Perception is defined by Schiffman and Kanuk (2010) as a phenomenon of personnel, where the reception of stimuli and prior experiences of individual consist of an individual interpretation of the surroundings. Meanwhile, Peter and Olson (2003) explained that perception is one's interpretation of stimuli coming from the environment. Stimuli produced by organic food are received by customers through their eyes (color), nose (odor), and mouth (taste). Thus, organoleptic organic food properties are the basis of the consumer's preference. According to Kotler and Keller (2012), consumer preferences indicated the choice of one's like or dislike of consumed products. Thus, consumer preference showed the consumer's like or dislike from various products. Sivathanu (2015) researched the factors influencing consumer preferences in organic food. The results showed that consumer perception had a significant and positive influence on preferences. In previous research, consumer preferences were formed because of the perception of organic food as a healthy food, harmless, nutritious, and eco-friendly product. Furthermore, Marchand, Walker, and Cooper (2010) confirmed that perceived individual or family benefits are essential variables affecting consumer's preference for adopting sustainable modes of consumption. Therefore, this study proposes hypotheses as follow:

H1: Consumer's perception influences preference towards organic food.

Several studies (Schleenbecker et al., 2018; von Meyer-Höfer et al., 2015; Wądołowska et al., 2008) demonstrated that the consumer's preference was another form of consumer attitude in the form of desires towards a product or service based on their abilities. Meanwhile, the purchase intention was a reflection of what the consumer would buy in the future. Attitudes or preferences toward food products have appeared as the most important factor of consumer purchasing intention (Yadav and Pathak, 2017). Previous research revealed that a lot of consumers hold favorable attitudes to organic food and would like to purchase of such products (Çabuk et al., 2014). Also, preference was found to have a substantial effect on purchasing intention (Pandey et al., 2019; Wu and Chen, 2014). The consumer's intention to purchase of organic food is the significant step that can shape the demand for organic food products. The research conducted by Naidoo and Ramatsetse (2016) on the measurement of the consumer's intention to purchase of the organic food showed that there was a significant link between consumer preference and intention to purchase. Moreover, Zhang et al. (2018) concluded that consumer's preference is important in influencing the consumer's intention to purchase of organic food. Hence, hypotheses proposed in this study is as follow:

H2: Consumer preference influences intention to purchase of organic food.

Previous studies showed that consumer perceptions positively influences intention to purchase of food products (Wądołowska et al., 2008). Given those results, the case of the organic food product is possibly similar in that the purchase intention is affected by the perception of consumers related to organic food. The purchase of organic food was due to the perception that organic food was safer, healthier, and environmentally friendly compared to conventional food. As consumers have always considered natural flavor, freshness and wholesome nutrition, they are heavily affected by taste perception when buying organic food (Cerjak, Mesić, Kopić, Kovačić, and Markovina, 2010). This argument was supported by Kareklas, Carlson, and Muehling (2014), concluding that consumer confidence in organic food has a positive effect on purchase intentions. The positive relationship between consumer's perception and purchase intention has been proven by some research (Singh and Verma, 2017; Zhang et al., 2018). Research, related to organic food consumption and conducted by Kapuge (2016), concluded that there was a significant influence between awareness and purchase of organic food. The high consumer awareness is formed from a good perception of organic food. Consequently, it would increase consumer purchase intention. Therefore, hypotheses proposed in this study is as follow:

H3: Consumer's perception influences intention to purchase of organic food.

Based on the literature and proposed hypotheses as previously described, the conceptual model proposed in this research can be seen at Figure 1.

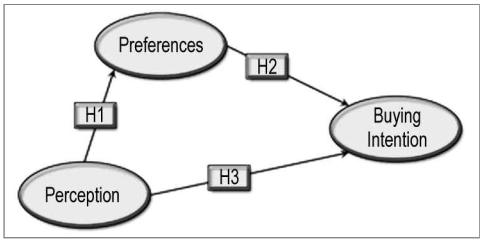


Figure 1. Conceptual model

2.2. Data Collection

The present study has been conducted in Metropolitan and around Metropolitan areas in Indonesia, represented by 5 major capital cities, namely Jakarta, Bandung, Semarang, Surabaya, and Bali. It lasted from May to August 2019. The first data collection in this research was carried out through a purposive sampling method in which the researcher determined the selection of respondents to meet the target of the organic food market, namely the middle-class segment group. For consumer oriented business, the middle-class consumers are often critical

targets since they are the underpinning of the consumer market and the driver of domestic demand (Euromonitor, 2015). Moreover, the middle class drives demand for high-quality goods since they are willing to pay extra for product with high-quality.

Some researchers might categorize consumers as a middle class based on personal income or wealth. In the present study, the class membership of the Indonesian consumer was evaluated through their consumption patterns and lifestyle. A lifestyle, considered as the middle class, prefers to go to modern markets such as a mall, supermarket, and specialty store rather than the traditional market (Ansori, 2009). The questionnaire was distributed among 400 respondents in malls, supermarkets, or around organic food stores. The selection of these places was expected to be a filter in the middle-class segment. The primary data collection in this present study was carried out through an in-depth interview.

2.3. Measurement and Data Analysis

To measure latent variable we used a number of observed variable. We adopted questionnaire items proposed in previous studies and make some revision according to the research context of the present study. We generate measurement of the construct variable as shown in Table 1. The questionnaire covered two parts. The first part presented the items of each construct, and the second part contained some question related the demographic information of respondents. Respondents scored items using a Likert scale with 5-point scale in which 1 means strongly disagree and 5 means strongly agree.

Constructs	Sources
1. Perception	(Mourad and Serag, 2012; Zhang et al., 2018)
2. Preferences	(Olsen and Tuu, 2017; Mourad and Serag, 2012)
3. Purchase intention	(Pandey et al., 2019; Conner et al. 2002; Fishbein and Ajzen, 2010)

Table 1. Constructs and the sources of literature *

**The measurement indicators are presented in Table 4*

The data were processed using descriptive analysis techniques to determine the distribution of consumer characteristics. Structural Equation Modeling (SEM) analysis has been applied to develop a model of consumer perception, preferences, and purchase intention. According to Byrne (2010), SEM is a multivariate statistical analysis technique allowing researchers to examine both direct and indirect effects between complex variables. Both recursive and non-recursive variables had 2 types of measurement, namely, measurement model and structural model, to obtain a comprehensive picture of a model.

3. Results and Discussion

3.1. Consumer Profile and Purchase Behavior

All of the 400 distributed questionnaires were included for data analysis since they were complete. Table 2 summarizes the demographic characteristics of respondents. Most consumers of organic food in the present study belonged to the category of educated middle-class customers. This result can be seen from the level of education, which is very good for most consumers; namely, 79.5% are diploma/bachelor graduates. Good formal education will be in line with income and the type of works. Some 37% of them worked as employees/professionals with an revenue of Rp 3,000,000 – Rp 7,000,000 per month (47.5%). The majority of those purchase organic food were females (67%), married (56.3%) with an average middle age of 30-49 years old (63%). These results were in line with those of the research conducted by Hughner et al. (2007), explaining that the consumers purchasing organic food are generally classified as well-established families, which have a good education, middle age, more females.

Characteristics	Frequency	Percentages (%)
Gender :		
- Female	268	67
- Male	132	33
Age (years old) :		
- <30	104	26
- 30–39	172	43
- 40–49	80	20
- >50	44	11
Education level:		
- Senior high school	34	8.5
- Dıploma/Bachelor	318	79.5
- Postgraduate	48	12
Job :		
- Government employee	114	28.5
- Professional/Employee	148	37
- Entrepreneur	96	24
- Others	42	10.5
Monthly income (Rupiah):		
- < 3 million	84	21
- 3 – 7 million	190	47.5
- 7 – 9 million	72	18
- >9 million	54	13.5
Marital status:		
- Married	225	56.3
- Not married	160	40
- NA	15	3.7
Domicile :		
- Jakarta	84	21
- Bandung	112	28
- Semarang	76	19
- Surabaya	59	14.8
- Bali	69	17.2
Residence :		
- Urban	267	66.8
- Suburban	108	27
- Rural	25	6.2

Tabel 2. Consumer profile

Regarding behavior, middle-class consumers tend to have a good perception of organic food. So, it is not surprising that most of them in this study (see table 3.) have already consumed or bought organic food (72%). Of the four types of organic food available, namely rice, vegetables, fruit, and others, the consumers preferred vegetable-type organic food (35%). This result was in line with the information provided by modern retailers that vegetable type of organic food has the highest demand compared to other types of organic food. According to Huang et al. (2014), more vegetables are eaten by people since vegetables are among the primary sources of the nutrients providing benefits of health.

Consumption patterns	Frequency	Percentages (%)
Consumer category:		
- Not yet consumed, already bought	36	9
- Have consumed, have not bought yet	76	19
- Already consumed and bought	288	72
Type of organic food consumed:		
- Rice	96	24
- Vegetables	140	35
- Fruits	70	17.5
- Processed food	34	8.5
- Others	60	15
Feeling after consuming organic food		
- Happy	256	64
- Nothing special	144	36
Regular purchase of 1 month 1 time		
- Yes	154	38.5
- No	206	51.5
- Not answer	40	10
A place to buy organic food :		
- Hypermarket	92	23
- Supermarket	124	31
- Specialty fruit store	108	27
- Others	76	19

Table 3. Consumption pattern towards organic food

Along with the development of the digitizing information issues, healthy lifestyles and environmental preservation are increasingly developing. Consumers are beginning to understand the importance of environmental conservation through the consumption of organic food. As many as 64% of consumers said that they were happy to consume organic food. However, most of them do not regularly (monthly) purchase organic food (51.5%). The low willingness of consumers to pay is thought to be related to the price of premium products. This result is consistent with that of the research by Shashi et al. (2016), stating that the elevated price of organic products and low production scale are factors hampering the market growth.

3.2. Evaluation of the Measurement Model

This research model was built with reflective measurements. All indicators have loading value factors meeting the usually recommended criteria, i.e., above 0.6 (Byre, 2010). In the developmental research model, indicators with loading value factors between 0.5 - 0.6 were allowed (Byre, 2010). Reliability and validity of instrument were evaluated to ensure that the research model can be continued for further analysis. Cronbach's alpha was evaluated against the standard threshold of 0.7 to measure the internal reliability of the data and the criterion for acceptable internal consistency of the data. Cronbach's alpha of the three variables was higher than 0.7 (see Table 4). Hair et al. (2017) stated that to validate sufficient internal consistency, value of Cronbach's alpha should be more than 0.70. The value of Composite reliability (CR) exceeding the threshold limit of 0.6, as recommended by Hair et al. (2017), proving that there was an acceptable level of internal consistency and reliability. Furthermore, the average variance extracted (AVE) across all the constructs should exceed the value of 0.5 benchmarks suggested by Byre (2010).

Variable and Indicator	Factor Loading	CR	AVE	Cronbach`s alpha
Perception		0.877	0.506	0.735
• Natural production	0.763			
• Production without preservatives	0.676			
• Production without chemicals	0.682			
• Looking fresh	0.710			
• The texture is good	0.715			
• Using ecofriendly packaging materials	0.803			
• Concern environmental sustainability	0.612			
Preference		0.926	0.610	0.824
• Organic foods make it easier to have a healthy lifestyle	0.753			
• Organic food can reduce damage caused by an unhealthy diet	0.748			
• Organic foods increase my well-being	0.798			
• It is completely safe to eat organic foods	0.747			
• Organic food has superior benefit	0.807			
• It make sense to buy organic food	0.829			
• It is better to consume organic food since it is more fresh	0.784			
• Due to environmental concern, it seems smarter to use organic	0.779			
Purchase intention		0.865	0.619	0.716
• I intend to eat organic foods for long term health benefit	0.752			
• I expect to eat organic foods regularly	0.685			
• I plan to eat organic foods because of safety concern	0.799			
• I intend to purchase organic food due to its eco-friendly nature	0.895			

Table 4. Construct reliability and variance extracted

Next, the suitability test of the data and the model. This stage is intended to evaluate the suitability degree between the data and the model. In empirical research, a researcher is not required to fulfill all the criteria of the fit goodness, as it depends on the judgment of each researcher. The use of four to five fit goodness criteria is considered sufficient in assessing the feasibility of a model, provided that each criterion is represented. The first criterion is the chi-square, which shows the models following the data. This study has a chi-square value within almost the appropriate category. Chi-Square is too sensitive to samples that are too large or too small. Therefore, this test needs to be backed up with other tests. The value of the Root Mean Square Error Approximation (RMSEA) matches the standard value required by an excellent index to accept the suitability of the model (see Table 5). Then, the Comparative Fit Index (CFI), which is also a conformity index, gradually gives good results. The overall model is following the actual data reflected by the Goodness of Fit Index (GFI) value above the standard.

No.	Criteria	Cut-off value (critical value)	Result	Notes
1.	Chi-square	< Tabled x^2 value df 141, p 0.1% = 198.635	336.512	Close to Fit
2.	RMSEA	< 0.08	0.059	Fit
3.	GFI	> 0.90	0.913	Fit
4.	CMIN/DF	< 5	2.387	Fit
5.	CFI	>0.90	0.958	Fit

Table 5. The goodness of fit final model test result

3.3. Hypothesis Testing

The results of the causality test in the SEM function is aimed at finding out the influence of one variable on other variables. The p-value in the table or the obtained probability is said to be influential when it approaches 0.001 and does not exceed the maximum value of 0.05 (0.00 < p-value < 0.05). Based on R2 value, the model explained 33.9% of the variance for preference and 28.4% for purchase intention. Table 6 denotes a summary of the structural model developed to determine the link between various factors within the model. The theoretical model was tested using the standardized path coefficient, Critical Ratio, and p-value. The higher the CR (Critical Ratio) value, the more significant the influence of a variable on others. The minimum value limit for CR is to be higher than 1.96 since the alpha used is 5%. To summarized, it can be seen from Table 6 that the tested hypothesis supports the positive influence of the perception, preference, and intention to purchase.

Hypotheses	Estimate	S.E.	C.R.	P	Decision
Perception ➔ Preference	.578	.052	9.761	***	H1 supported
Preference ➔ Purchase intention	.314	.064	4.728	***	H2 supported
Perception ➔ Purchase intention	.285	.057	4.311	***	H3 supported

Table 6. Result of hypotheses testing

3.4. Discussions

The research aimed to determine the factors affecting the intention to purchase of organic food. It endeavors to extend the literature by examining the role of consumer's perception and preference in organic food and their influences on the intention to purchase in a developing country context, Indonesia. Therefore, it provides an interesting comparison with preceding research, mainly those conducted in Western countries. Based on the results, variables including consumer's perception and consumer preference represent the drivers affecting the intention to purchase of organic food in Indonesia.

The consumer's perception variable significantly influences the consumer's preference (estimated value of 0.578; p-value < 0.05). Thus, hypothesis 1 is accepted. This result is in line with previous research (Marchand, Walker and Cooper, 2010; Sivathanu, 2015). The perception factor is significant in the organic food product context in Indonesia, as it has been found in different places such as developed countries. The more the people perceiving organic food as healthier and safer, the higher their motivation to consume these products. Consequently, Indonesian organic food producers and marketers must educate the Indonesian market so that consumers will have a positive perception regarding organic food.

This research found that most consumers perceived that organic food is naturally preservative-free so that it can produce products that are safe and free from dangerous chemicals. Through its natural production methods, organic food is seen as an environmentally friendly product, concern environmental sustainability, looking fresh and the texture is good. The results of the present research are consistent with the research by Yadav and Pathak (2016), confirming the significant influence of environmental concerns on consumer's preference towards organic food.

Furthermore, the magnitude of the effects between consumer's perception and the preference in this study was 0.578. That value is categorized as a strong influence conveying the picture that the better the consumer's perception of organic food, the higher their preference for that food. The results supported the theoretical framework proposed by Schiffman and Kanuk (2010). It assumed that the perceptions appear along with consumer involvement, while memory will influence the processing of information, creating an appropriate preference response.

Consumer preference was found to be positively and significantly linked to purchase intention. The results of this research (see Table 6) explained that consumer's preference for organic food significantly affected the intention to purchase of organic food (p-value ≤ 0.05). Therefore, hypothesis 2 is accepted. The effects on that pathway have a path coefficient of 0.314, indicating that the higher the level of consumer preference, the greater the intention to purchase of organic food. Those findings support previous literature, proving the positive link between consumer preferences and intention to purchase (Wu and Chen, 2014).

However, these results contradicted those of previous research conducted by Pham et al. (2018). According to the latter study, there is no significant impact of perception on product attributes (sensory aspects) to preferences of organic food in Vietnam. Nonetheless, the results in the present study are in line with research conducted in western and developed countries context (Paul and Rana, 2012; von MeyerHöfer et al., 2015). Research by Magnusson et al. (2003) emphasized that better and acceptable taste was the most crucial factor in consumer purchase decisions towards diverse types of foods. Meanwhile, Marina, Marija, and Ida (2014) stated that good taste was among the most relevant attributes for food purchases and consumption particularly for young consumers.

Although the context of this study is Indonesia as a developing country, the results in line with other research findings in developed countries context support the positive link between consumer preferences on organic food attribute and intention to purchase. The findings of the present research notably revealed that consumer perception to sensory aspects are fundamental in developing preferences toward organic food. Consequently, organic food producers and marketers should promote such sensory aspects to their prospective consumers in Indonesia to improve consumer's preferences.

Furthermore, tests were conducted on the effect of perceptions on the consumers purchase intention regarding organic food. As predicted in hypothesis H3, the consumer's perception influences the intention to purchase of organic food. The results of the present study (see Table 6) confirmed that the consumer's perception about organic food significantly affected the intention to purchase of organic food (p-value < 0.05). Thus, H3 is accepted. Although the magnitude of the effect had the smallest value (0.285) compare to other variables, the coefficient still indicates that the probability of the variable of intention to purchase is higher when consumers have a better perception of organic food attributes. These results are consistent with those of the research conducted by Vukasovič et al. (2016). They explained the relationship between perceptions of consumer and behaviors regarding organic fruits and vegetables in Slovenia. The research findings described that in terms of organic food consumption, the consumers must generally have good knowledge first so that they can positively perceive organic food, which will affect the purchase intention through a level of preference or right preference for organic food. Furthermore, consumer demands towards healthier products, such as organic food has been driven by increasing health concerns (Euromonitor, 2015).

Some information on attributes was extracted to determine the highest priority of consumers when purchase in order to make an initial mapping of consumers' perceptions and preferences in organic food. The descriptive-frequency results (see Figure 2.) indicated that nutrient content and prices were the essential attributes taken into account by consumers when purchase organic food, 31%, and 32.8%, respectively. A balanced percentage between nutrition and price aspects illustrated that middle-class consumers included well-educated and smart consumers. In that segment, consumers have willingness to pay more for good quality products. The middle segment consumer represents a prospective market because it focuses on purchasing products that can improve the standard of living. The research of Ahmed, Khan and Samad (2016) revealed that several countries (such as Argentina, Brazil, Chile,

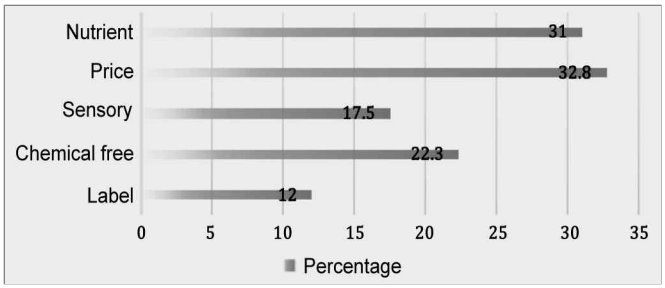


Figure 2. Priority attribute of organic food

China, India, Indonesia, and Russia) have a middle-class consumer segment overgrowing, illustrating that organic food market is increasingly significant and prospective.

In contrast, the priority of this attribute was in line with research by Zander et al. (2018), explaining that prices are one reason for consumers not to buy organic food. In general, premium products, such as organic food, must have a balance with the superior value offered. Efforts that can have implications for increasing the purchasing power of organic food can be made through standardization, certification, communication, and labelling (Zander et al., 2018). The standardization aspect can be done by providing added value or additional benefits compared to conventional food. Thus, consumers will be increasingly convinced that organic food has its competitiveness and superiority. Certification is needed to ensure the consumers get quality guaranteed products from the suppliers. On the other hand, the aspects of information communication through labelling and other media are important in shaping perceptions that have effect on increasing the purchasing power of organic food consumers.

4. Conclusion

In general, the consumer's profile of organic food belongs to the middle-class segment with a relatively high level of education, and the majority of which are married females at an established level. The most popular types of organic food are organic vegetables. Although most people say, they like to consume organic food, the purchase of this product has not become a monthly shopping routine. In the SEM analysis model, there is a significant link among consumer's perceptions, preferences, and purchase intentions.

The present study provides an important insight along with several implications for organic food producers, marketers, and policymakers in designing and developing strategies aimed at promoting consumption of organic food in Indonesia. The Indonesian government has been encouraging people to consume organic food trough the "go organic" campaign. However, such a campaign should be endorsed through above the line presentation such as TV, advertisement, and radio. Moreover, since the role of social media such as Facebook, tweeter and others become a national and global trend, campaign of organic food should consider social media as an effective tools of communication so that consumers will have a better perception of organic food with particular regard to consuming organic food. Additionally, organic food campaigns and education programs should focus on young consumers since they are the future consumers of organic food as eco-friendly food (Pham et al., 2018).

Strategy to increase the purchase and consumption rate of organic products should be in line with the improvement from the production system and product attributes. The determination of standardization, certification, and labeling are important points in convincing consumers on the advantages of organic food, which in turn will ultimately increase the willingness of customers to pay. Local farmers with a relatively small business scale can contract with agribusiness enterprises having more access to certification and labeling. As a supplier, the farmers must document each stage of organic farming as a standard for standardization. Furthermore, labeling can be done in collaboration with or using NGO funds, focusing on the issue of organic food in developing countries. Labeling in the form of inclusion of a logo or brand is a crucial matter that is taken into account when purchase organic food, so the information listed should be short, clear, and describe superior valuation.

Although the results of this research are reliable in explaining the relationship among variables affecting the intention to purchase of organic food in Indonesia, the outcomes can be generalized through attention, bearing in mind some limitations in the present study. The first limitation was the sample size and the non-inclusion of more cities. Samples were only 400 respondents, which was too small compared to the Indonesian population. Data were collected data from five major capital cities on Java Island. Since Indonesia consisted of many islands, ethnical, and cultural differences in perceptions and preferences may exist and influence the purchase intention. Thus, it is suggested to enlarge the number of samples and locus of the study to improve generalization.

Acknowledgment

This research was financially supported by a research grant provided by the Ministry of Research, Technology and Higher Education of the Republic of Indonesia. Grant Agreement Number 4131/IT3.L1/PN/2019. We would like to thank all those who have assisted us in the process of building this paper.

References

[1] Annunziata, A. Vecchio, R. (2016). Organic farming and sustainability in food choices: an analysis of consumer preference in Southern Italy. *Agriculture and Agricultural Science Procedia*, 8: 193-200.

[2] Ahmed, ME., Khan, MM., Samad, N. (2016). Income, social class and consumer behavior : A focus on developing nations. *IJABER*, 14(10): 6679-6702.

[3] Ansori, H.M. (2009). Consumerism and the emergence of a new middle class in globalizing Indonesia. *Explorations: A graduate student journal of Southeast Asian studies*, 9.

[4] Byre, MB. (2010). *Structural Equation Modeling with AMOS basic concept, application and programming*, second edition. Taylor and Francis Group, LLC.

[5] Çabuk, S., Tanrikulu, C., Gelibolu, L. (2014). Understanding organic food consumption: Attitude as a mediator. *International Journal of Consumer Studies*, 38: 337-345.

[6] Chen, MF. (2007). Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits. *Food Quality and Preference*, 18: 1008-1021.

[7] Conner, M., Norman, P., Bell, R. (2002). The theory of planned behavior and healthy eating. *Health Psychology*, 21: 194-201.

[8] Dangelico, RM., Vocalelli, D. (2017). "Green marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature. *J. Clean. Prod.*, 165: 1263-1279

[9] Euromonitor (2015). https://www.euromonitor.com/middle-class-consumers-values-and-priorities/report (accessed 24.03.2020).

[10] Fishbein, M., Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York, NY: Psychology Press.

[11] Hair, J.E., Hult, G.T., Ringle, C.M., Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modelling (PLS-SEM)* (2nd ed.). Thousand Oaks: Sage.

[12] Huang, Z., Pan, X.D., Wu, P.G., Han, J.L., Chen, Q. (2014). Heavy metals in vegetables and the health risk to population in Zhejiang, China. *Food Control*, 36(1): 248-252.

[13] Hughner, R.S., McDonagh, P., Prothero, A., Shultz, C.J., Stanton, J. (2007). Who are organic food consumers? A compilation and review of why people purchase organic food. *Journal of Consumer Behaviour*, 6(5): 94-110.

[14] Indonesia Organic (2014). http://www.indonesiaorganic.com/indonesia-news/pertumbuhan-pangan-organik-nasional-hanya-5-persen-suaramerdeka (accessed on 21.09.2019).

[15] Kareklas, I., Carlson, JR., Muehling, DD. (2014). "I Eat Organic for My Benefit and Yours": Egoistic and Altruistic Considerations for Purchasing Organic Food and Their Implications for Advertising Strategists. *Journal of Advertising*, 43(1): 18-32.

[16] Kotler, P., Keller, KL. (2012). *Marketing Management*, 14th Edition. Prentice Hall.

[17] Kapuge, K.D.L.R. (2016). Determinants of organic food purchase behavior: special reference to organic food purchase intention of Sri Lankan customers. *Procedia Food Science*, 6: 303-308.

[18] Magnusson, MK., Arvola, A., Hursti, UKK., Åberg, L. (2003). Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour. *Appetite*, 40(2): 109-117.

[19] Mourad, M., Serag, Y.E.A. (2012). Perception of green brand in an emerging innovative market. *Eur. J. Innov. Manag*., 15 (4): 514-537.
[20] Marchand, A., Walker, S., Cooper, T. (2010). Beyond abundance: self-interest motives for sustainable consumption in relation to product perception and preferences. *Sustainability*, 2: 1431-1447.
[21] Marina, T., Marija, C., Ida, R. (2014). Functional foods and the young. *Journal of Food Products Marketing*, 20(5): 441-451.
[22] Naidoo, V., Ramatsetse, M.H. (2016). Assessment of the consumer purchase intentions of organic food at the Hazel food market in Pretoria, South Africa. *Environmental Economics*, 7(3): 81-88.
[23] Olsen, S.O., Tuu, H.H. (2017). Time perspectives and convenience food consumption among teenagers in Vietnam: The dual role of hedonic and healthy eating values. *Food Research International*, 99: 98-105.
[24] Pham, T.H., Nguyen, T.N., Phan, T.T.H., Nguyen, N.T. (2019). Evaluating the purchase behavior of organic food by young consumers in an emerging market economy. *Journal of Strategic Marketing*, 27(6): 540-556.
[25] Pandey, D., Kakkar, A., Farhan, M., Khan, TA. (2019). Factors influencing organic foods purchase intention of Indian customers. *Organic Agriculture*, 9: 357-364.
[26] Paul, J., Rana, J. (2012). Consumer behavior and purchase intention for organic food. *Journal of Consumer Marketing*, 29: 412-422.
[27] Peter, J.P., Olson, J.C., (2003). *Consumer behavior and marketing strategy*, Third Edition. Boston: Irwin. M
[28] Rana, J., Paul, J. (2017). Consumer behavior and purchase intention for organic food: A review and research agenda. *Journal of Retailing and Consumer Services*, 38: 157-165.
[29] Sazvar, Z., Rahmani, M., Govindan, K. (2018). A sustainable supply chain for organic, conventional agro-food products: the role of demand substitution, climate change and public health. *J. Clean. Prod*., 194: 564-583.
[30] Schiffman, L, Kanuk, LL. (2010). *Consumer behavior, global*. 10th ed. New York (NY): Pearson Education, Inc.
[31] Schleenbecker, R., Zander, K., Hamm, U. (2018). *Consumers information search and preferences for fair trade coffee: a case study from Germany. Fair trade and organic agriculture: A winning combination?* 76-87. CAB International. UK.
[32] Shashi, Kottala, SY., Singh, R. (2016). A review of sustainability, deterrents, personal values, attitudes and purchase intentions in the organic food supply chain. *Pacific Science Review B: Humanities and Social Sciences*, 1(3): 114-123.
[33] Singh, A., Verma, P. (2017). Factors influencing Indian consumers' actual purchase behavior towards organic food products. *Journal of Cleaner Production*, 167: 473-483.
[34] Sivathanu, B. (2015). Factors affecting consumer preference towards the organic food purchases. *Indian Journal of Science and Technology*, 8(33), DOI: 10.17485/ijst/2015/v8i33/78261.
[35] von Meyer-Höfer, M., Olea-Jaik, E., Padilla-Bravo, CA., Spiller, A. (2015). Mature and emerging organic markets: Modelling consumer attitude and behavior with partial least square approach. *Journal of Food Products Marketing*, 21(6): 626-653.
[36] Vukasovič, T. (2016). Consumers' perceptions and behaviors regarding organic fruits and vegetables: Marketing trends for organic food in the twenty-first century. *Journal of International Food and Agribusiness Marketing*, 28(1): 59-73.
[37] Willer, H. L. Kilcher, Eds. (2011). *The world of organic agriculture: Statistics and emerging trends*, IFOAM, Bonn, and FiBL, Frick.
[38] Wądołowska, L., Babicz-Zielińska, E., Czarnocińska, J. (2008). Food choice models and their relation with food preferences and eating frequency in the Polish population: POFPRES study. *Food Policy*, 33(2): 122-134.
[39] Wu, S.-I., Chen, J.-Y. (2014). A model of green consumption behavior constructed by the theory of planned behaviour. *International Journal of Marketing Studies*, 6(5): 119-132.
[40] Yadav, R., Pathak, G.S., (2017). Determinants of consumers' green purchase behavior in a developing nation: applying and extending the theory of planned behavior. *Ecological Economics*, 134, 114-122.
[41] Zander, K., Schieenbecker, R., Hamm, U. (2018). *Consumer Behavior in the organic and fair trade food market in Europe. Fair Trade and Organic Agriculture: A Winning Combination?* 51-60. CAB International. UK.
[42] Zhang, B., Fu, Z., Huang, J., Wang, J., Xu, S., Zhang, L. (2018). Consumers' perceptions, purchase intention, and willingness to pay a premium price for safe vegetables: A case study of Beijing, China. *Journal of Cleaner Production*, 197(1): 1498-1507.