

“JTC” MANAGEMENT IN DISASTER INFORMATION SYSTEM

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Abstract

This research's purpose is to know Disaster Information System Management of Jogja Tanggap Cepat (JTC) in manage Merapi eruption information in Yogyakarta. Jogja Tanggap Cepat is society movement who concerned to the Merapi eruption at 2010. This research used qualitative approach to analyze JTC Disaster Information System. the informant of this research was Cangkringan society, the head of JTC, multimedia division, and JTC volunteer coordinator. Data collection technique was done by deep interview. The data collection is then analyzed by using descriptive analysis model. The research result is in the form JTC Disaster Information System concept. The research shows that JTC information and communication technology have potential to play an important role of Eruption disaster information to society. Information and Communication Technology encompasses both the traditional media (radio and television) and new media (mobile broadcasting, the Internet, satellite radio), all of which can play an important role in educating the public about the risk of a potential disaster or disaster that will come. JTC information and communication technology used as channel to spread the information of the clues of Merapi eruption based on local wisdom. By this information, society can knows earlier the clues, so they can survive independently. Jogja Tanggap Cepat together with local government, Yogyakarta government, and supported by XL axiata built a program “Java Semesta”, the program based on ICT by using information and communication technology. In this program, a system of data collection, data management and information was created and used in the information management of Mount Merapi eruption based on IT and community participation. This system is expected to play an effective role in raising awareness information of the eruption of Mount Merapi.

Keywords: Management, Information, Local Wisdom

Introduction

Indonesia as a disaster-prone state because it's position in three active tectonic plates that are Eurasia plate, Hindia-Australia plate, Pacific plate and including as *Ring Of Fire* (Glenn; 2013, Setyowati; 2014). With many disasters in Indonesia, whether it caused by

nature, non-nature or social disaster, Indonesia can be a “disaster laboratories”. Disaster management cycle, in vision, mission of BNPB and national system of disaster prevention. The priority of disaster management is development the capacity of disaster prevention, like through education and training, research and knowledge and technology, also integrated with local wisdom in applying information system by technology utilization in the disaster prevention effectively.

In the process of natural disaster prevention, the need of not only logistic aspect, accommodation and transportation, healthy or clothes but also the need of information system in disaster preparedness process that utilized information based on local wisdom so it need to easier do the information by operational systematically and well control (Deeg; 2005, Chen; 2006, Kasdan; 2016). Because of that, disaster information system management become absolute applied so the information that gotten from the society can be easier to spread.

Information system management is system information application in organization to support information that needed by entire level of society (Mulligan; 2012, Bhandari; 2014, Cheney; 2016). Group of information systems interaction that responsible to collect and process data to provide the information from society is useful for the entire level of society in preparedness of facing Merapi eruption. It always related with information process based on a *computer based information processing*.

Management Information System (MIS) is a system based on computer that provides information for many users with same needs (Oikawa; 2012, Kasdan; 2016). The users usually make a formal entity organization, government or non-government. The information explains the event or the clues of Merapi eruption based on social wisdom, one of main systems about society experience at the past, that happen now and what can happen next. That information is available in the form of periodic report, special report and output. The output information used by manager or non manager in organization when the operator makes decision to solve the problem.

Local wisdom is the way and practice that develop by group of society that came from deep understanding of their local environment, that formed in that place hereditary and be entrenched (Pyles; 2011, Oikawa; 2014, Siri; 2016). Some important knowledge based on this local wisdom characteristic, from the society itself, develops to the future generation and easy to adopt by them.

The main activity from all information system that is receiving data as input then respond it by doing calculation, data element merger, update and etc, finally get information as output. Data changing become information is done by information manager. Information manager can involve computer elements, non-computer or both. Based on this reality, then the researcher was done the research of Disaster Information System Management based on local wisdom in Jogja Tanggap Cepat (JTC).

Material and Methods

This research used qualitative approach. It was done in Cangkringan districts, Yogyakarta. The reason Cangkringan districts is chosen because geographically it is in the south of Merapi mountain, makes the location is very susceptible to Merapi eruption threat. Data collecting instrument is in the form of observation (participantly, straightforward and vague, unstructured), interview (using descriptive question, structural question, and contras question), and documentation. Data analysis technique used domain, taxonomy, componential technique analysis with organizing process and reduction data into pattern, categorize and basic unit description so can be decided the theme and can be formulated a conclusion. Cultural theme analysis is done at data collection and after done the data collection. The analysis that done in

this case is arranging, sorting, coding, and categorizing data so can found the appropriate description.

Literature Review

To support this study, there is a need for a theoretical framework to be used as a theoretical basis in the problem discussion. Theoretical framework in this study, include:

1. Management

According to Terry (1993), management as a process has different definitions given by the experts. There are three definitions of management in encyclopedia of the social science. According to the first definition, it is said that management is a process by which the implementation of a particular purpose is implemented and supervised. According to the second definition, management is a collectivity of people who conduct management activities in a particular agency.

Management by Terry (1993), can mean an art or a science, that management is a process or framework, which involves guidance or direction of a group of people towards organizational real goals or intentions. Management also is a science and an art. Art is knowledge of how to achieve the desired results or in other words, art is a skill gained from experience, observation and learning, and the ability to use management knowledge.

According to Follet, (1996) management is an art to carry out a job through other people. The definition of many contains attention to the fact that managers achieve an organizational goal by organizing other people to carry out what are needed in the job, not by carrying out the work by themselves. That is management, but according to Stoner 1994: 33) Management doesn't only mean that. There are even more definitions so that there is no single definition that can be universally accepted. According to Stoner, management is a process of planning, organizing, leadership, and control efforts of the organization members and use all the resources of the organization to achieve the intended purposes.

2. Information System

According to Jogiyanto (1999), information is data that have been processed into a meaningful form to the receiver and useful in current or future decision making. So information is data that have been processed into a meaningful form to the recipient and useful in current or future decision making.

Information in an information system environment has several characteristics, namely:

1. True or false, it can be related to the reality or not when reception of wrong information is believed to lead to the one as the true,
2. New, information may be completely new and fresh for the recipient
3. Additional, Information may renew or give a new addition to the existing information
4. Corrective, the information can be a corrective on wrong information
5. Affirmation, information can reinforce the existing information, it is useful because it increases the perception of the recipient or correctness of the information.

Information can be said to be qualified if it has met the following criteria:

1. Information should be accurate and clear, that the information that does not contain any doubts, has the same intentions between what is delivered and what is received, free of mistakes and does not finish, should explain and reflect the intentions or in other words, does not raise questions for the information recipient.
2. Up to date (on time), that the information comes to the recipient not too late because the information that is not on time does not have any value.

3. The information must be relevant, that the information can be received for people who need it or beneficial for those who receive.

Some supportive devices of information systems and data communication are: the Internet (interconnected network), it is a global communication system that connects computers to computer networks worldwide. Based on these definitions, we can state the keywords of computer and network. Internet is a medium to deliver information that can be accessed anywhere in the world. When you have a computer at least 486 processor, windows 95, modem and telephone line, then you can join the thousands of millions of other computers around the world and access a treasure trove of information in the internet. The media often used in internet are web browser, search engine, e-mail.

In the information system there are also supportive devices that help the process of verbal and non verbal communication, such as computer networking applications, communication between computer users, publications or information exploration, and on-line information system. Once the devicea are met, one thing that must be considered in the information system is the data base that will be published as the work of the information system itself (The training materials of information system of disaster management of Papua Province local government as a cooperation of Disaster Research Centre (PSBA) of Gadjah Mada University in Yogyakarta and Papua local government in 2006).

3. Disaster Management

Based on the disaster management theory developed by Blaikie (1994), the concept of Disaster Management includes several phases: emergency response (response phase), reconstruction and rehabilitation phase, preventive and mitigation phase and preparedness phase; then the disaster relief efforts must be supported by adequate information system. The system is expected to be able to: 1). Improve the ability of disaster planning for all disaster management mechanisms, both central and local levels at all phases of Disaster Management; 2). Support the implementation of a disaster event reporting accurately and quickly, including in the monitoring and development of disaster occurrence: and 3). Provide complete and actual information to all parties concerned with the elements of disaster management in Indonesia and foreign countries through a global network facilities.

The natural disaster term has become common for Indonesian society that no longer has a bad connotation especially in Yogyakarta, because natural disaster can be defined as the impact of even the excesses of the nature forces that can not be blocked by human strength. Such as earthquakes, landslides, floods, typhoons, cold lava, even hot clouds due to the eruption of Mount Merapi and many other disasters that afflict the majority of mankind, or natural disaster is defined as a natural activity that can create human needs, where the victims of natural disasters can no longer bear their own burden without the help of others.

In developed and developing countries, the issue of natural disaster has been an important part to think about, so it is known by the term "disaster management" which means all activities related to natural disaster that have been well prepared, from early warning to the recovery action. holistic management is highly required, not only a single action. It is an essential component of any development framework. Appropriate disaster management has been recognized as a key requirement in achieving the millennium development goals (MDGs) by the specific target by the year of 2015. Information and communication technology for the development of disaster information system becomes an absolute necessity.

4. Community Wisdom

Community wisdom is the way and practice that developed by a group of people in the community which comes from a deep understanding of the local environment, which is

formed in that place hereditary and be entrenched. There are some important knowledge derived from the characteristics of this community wisdom, which come from within the community itself, formally and informally disseminated, owned collectively by the certain community, developed to generations and are adaptable, and are embedded in the way of life of the community as means to survive (Koentjaraningrat 1991).

Local wisdom is a contextual culture or local ideas that are wise, full of wisdom, have good value, embedded and followed by the community members as well as the view of life and science in the form of tangible activities undertaken by local communities in addressing different issues in fulfilling the community needs (Koentjaraningrat 1991).

Based on the opinion of Koentjaraningrat it is revealed that the coverage of local wisdom includes perception, attitudes, and community social action, such as advice, traditions, politeness, manners, and *udanegara*. The community wisdom can be further simplified to facilitate the delivery of implicit educational values in the wisdom of the community itself. Simplification of the community wisdom may be in the form of advice or messages to the public. This advice contains the virtues, the wisdom, and discernment.

5. Management Information System

Management Information System (MIS) is not the Overall Information System because not all information in the organization can be incorporated fully into an automated system. The main aspects of Information Systems will always be outside Management System (Jogiyanto, 1990).

According to Jogiyanto, (1990) the development of sophisticated computer-based MIS need a number of highly skilled and long time experienced people and require the participation of the organization's managers. Many organizations fail to build it due to;

1. Lack of legal/formal community organizations
2. Lack of adequate planning in social organizations
3. Lack of personnel or members of community organizations who are highly skilled in the field.

Good MIS is able to balance the costs and benefits to be gained. It means that SIM will save costs, increase intangible revenue which arise from the very useful information. Organizations should be aware if they are quite realistic in their desire, meticulous in designing and applying MIS to fit the desires and be reasonable in determining the cost limit of the benefit point to be gained, then the resulting SIM will provide benefits and money (Jogiyanto, 1990).

According to Sutrisno, (1987) theoretically, a computer is not an absolute requirement for MIS, but in practice there is no good MIS without being assisted by computer processing power. The main principle of planning MIS is that it must be implemented carefully to be able to serve the main task. The goal of Management Information System is to meet the general information needs of all managers in the company or in the company's organizational subunits. MIS provides information to the user in the form of reports and outputs of the simulation of mathematical models. Knowledge of computerized information system capabilities will allow the Manager to systematically analyze each organizational task and adapt it to the computer capabilities (Sutrisno, 1987).

In particular, MIS has some technical abilities as planned for it. Collectively these capabilities refuting the claim that the computer is just a high capacity summation machine or calculator, the computer actually can not do everything. It just does anything faster. Information system is generated by the existing system, some of the most important technical capabilities in computer systems (Jogiyanto, 1990) are;

1. Single data processing

2. Batch data processing
3. On-line, real time processing
4. Data communication and message switching
5. Entry of remote data and files updating
6. Records and analysis searching
7. File searching
8. The algorithms and decision models
9. Office automation

Results

In this context, information and communication technology have potential play an important role in disaster, prevention mitigation and management. Remote sensing to early detection is possible by many technologies, including telecommunication satellite, radar telepathy and metrology.

Information and communication technology include either traditional media (radio and television) also new media (cellular, internet, satellite radio) that all can played important role in educate the society about potential disaster risk or the next (Yen; 2006, Xi Zhang; 2013). Before the disaster, Information and communication technology used as channel to take security action that needed to decrease the effect of disaster. to realize this, it is important the consistency in applying the information system and alarm message spread in at risk locations. That spread has to wide and new to educate society about risk potential of disaster problem.

The alarm system is never effective without education component, next JTC plays important role in facilitate reconstruction process and in coordinate become back society who evacuate because of disaster to their own home. Disaster management activity, after disaster can made more effective by using right Information System (like internet communication application), collecting important thing for the victim also National and International fundraising.

Electronic media considered most traditional way that used to disaster alarm, radio and television have valid application, and effectiveness of both media is highest even in development countries and village environment where television density is relative low. This media can be used to spread the alarm quickly to the wider population, the weakness of both media are the effectiveness decrease significantly at night when it shouts down (Permana, 2016).

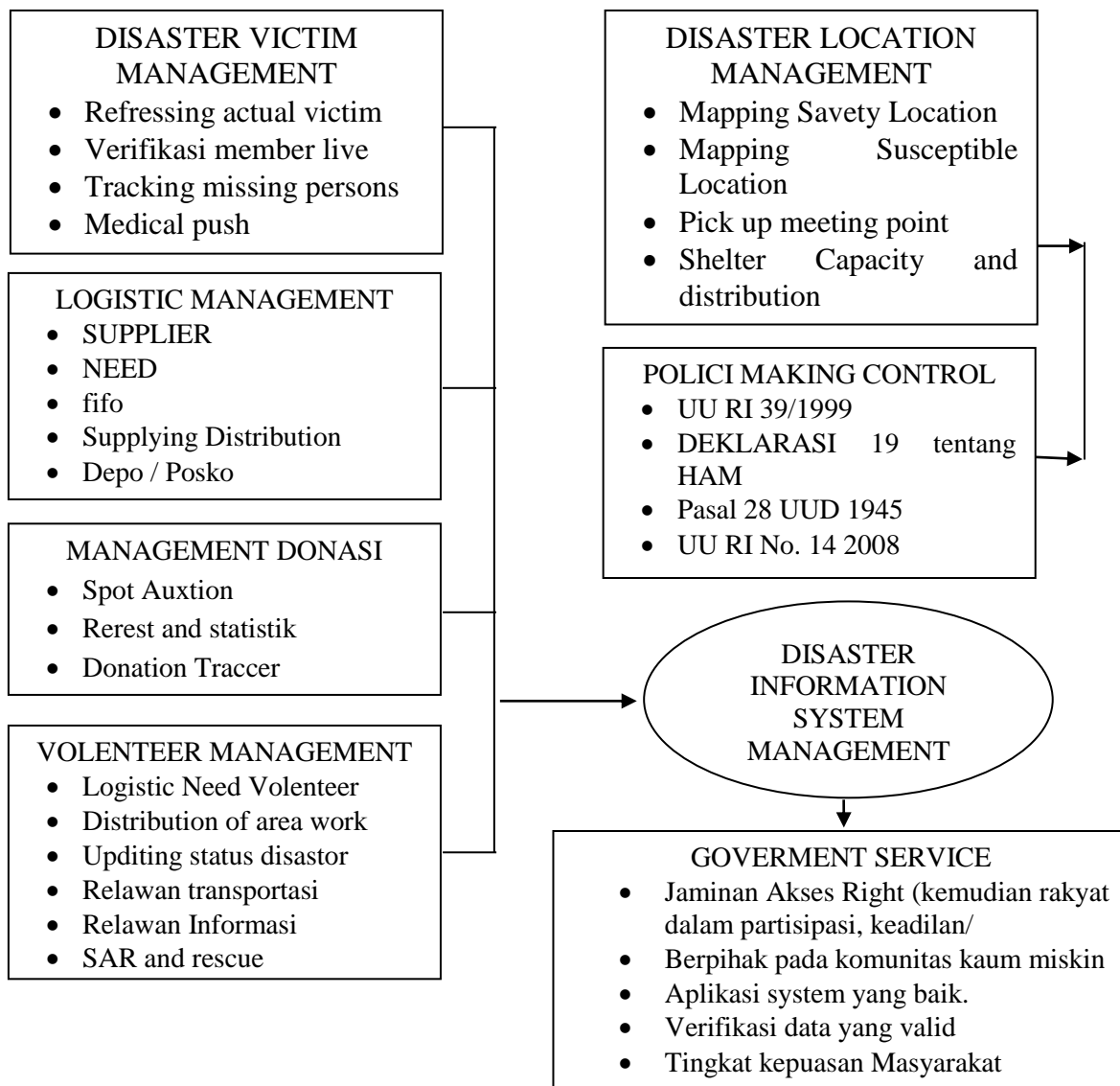
Internet is media that may can connect the location where untouched by disaster. Java Semesta called in some internet applications that used in post disaster respond, especially in two main aspects (Permana, 2016).

Coordination of help seeking and find information of lost person because system error, donor is also find themselves do as help distributor too, it can said that internet become valuable source for the society or non-government organization Playing central role in providing discussion list for foundation coordinator so donor can find entity who is most need (Zermans; 2005, Permana, 2016).

Identification what are they need, and in some cases find how to get there, internet also used to give information about the position of family member who loose. For example, many organizations are made "line message", that do as finding person database, their condition or damage level of the place they live (the important of information security and privacy cannot be underestimate in humanity system based on ICT. In this case, personal data is not only about encryption problem but also about death or life. If data fall in the wrong hand, it can make disadvantages thing. Technology and frame work conceptualized and applied must be

realize of the field condition, either social problem or tense among ethnic group, fraction and non public actor, must be find the solution (Prajanti; 2013, Permana, 2016).

From JTC experience, together built network JRKY and local Radio media like Sonora FM, KR Radio and Swaragama, synergy to give educated entertainment for Merapi victims. Have to be realize before that not only entertainment but also information and networking system have to be done. JTC does the cooperation with Jogja TV, RB TV and Sonora FM Radio, KR Radio. For more detail, new a system and mechanism also disaster information access can be seen in Picture 1.1, bellow;



Picture 1.1 Jogja Tanggap Cepat Information System Management
(Source: Permana, 2016)

At Merapi eruption that was done in Yogyakarta year 2010, Jogja Tanggap Cepat together synergy to share the role in doing activity in many aspect; (Permana, 2016)

1. Managing right accurate information
2. Managing foundation information
3. Managing aid distribution information
4. Creating conducive situation & recover condition

The four things are the main thing that needed by many people in many ways of concern. Many things that published are:

1. List of refugee post
2. List of anticipation data of Yogyakarta city of the aid for society who attached Merapi eruption.
3. List of the aid and volunteer
4. Real step together, right target, the result of conclusion of many creative ideas from many parties.

Discussion

Appropriate with this, after Merapi eruption in Yogyakarta, Jogja Tanggap Cepat together with local government and supported by XL axiata built a program of "Java Semesta", the program based on ICT and using communication and information technology. In this program, made a system of data collection, data analysis, and the information that used in information management of Merapi eruption based on IT and society participation. It hoped that this system can plays effective role in increasing awareness to Merapi eruption. try to associated society preparedness to Merapi eruption while spear car to utilize many communication and information technology equipments, and the best way to use communication and information technology equipments that success in facing Merapi eruption threat.

JTC has web, free software and open resource based on system that developed by friends from P3I DIY, are application website that providing solution to problem that rise in the situation post disaster (Permana, 2016).

A reality that has to accept that Indonesia is of many countries that full of disaster. At least, the city like Jakarta that the flood becomes annual subscription, then other disasters like landslide, earthquake that makes victims (Setyowati; 2014, Permana, 2016).

In every disaster, need of information become critical. In Merapi eruption at 2010, e-mail and massage about question of location condition, victim condition, searching for families, searching for aid and searching for help. On the other side, the volunteer who try to help also dizzy to search location that need help, searching for the address to send the aid- foods, drugs- searching the disaster location, find the refugee camps. All is mazy and there is no centre information source, no reliable communication (Permana, 2016).

Jogja Tanggap Cepat is a civil society movement who concern to Merapi eruption with philosophy and solidarity spirit to have mutual sharing and care. The rise of heart and mind together and real movement sees the long impact of Merapi eruption (Permana, 2016).

Disaster management application based on information system or IT is not many do yet, so JTC take initiative in prevention Merapi eruption that happen in Cangkringan, Yogyakarta by utilize information system as facilities to help the victim and manage the aid distribution process to the right target. However, there are obstacles and problems for JTC that are the road and information spread because difficult network in Cangkringan. Almost Cangkringan society are still traditional, especially the elders who are not familiar with IT. It makes the difficulty of technology utilization based on Computer or Telecommunication (Prajanti; 2013, Permana, 2016).

From the recent experience, it show that there is no location in Indonesia that is no under the threat of disaster, although the location is in safety level but there is not close the possibility to be always ready to the disaster, and it is not a choise, it is an obligation without see the location. So become very important for the local government or *stakeholder* who involve in the activity of disaster countermeasures, identification, know the spread map,

logistic need map, etc. Moreover the information is also can be used to manage the social effects.

Therefore to rebuild together Yogyakarta, it is proper for local government free the activities of promotion and branding in the form of community service. That case, add Mr. Indro as the head coordinator of JTC “as spirit for us especially the victims”. If needed, said Mr. Indro, local government also make free the cost for National media that came to Yogyakarta to give positive information about Yogyakarta then can inform to Yogyakarta society and the society outside Yogyakarta. National media can coordinate by informing the important and positive thing. All of that is to rebuild Yogyakarta.

Because of the Merapi eruption, a lot of societies who are not know information that related with their own place, whether it is safety or not because they move to outside town, this needs accurate information. Negative information can make visitor to Yogyakarta decrease. Not only have those, the students who study in Yogyakarta also decreased. In this case study, can be learned that JTC can manage the information that next will spread to society to know their place also other communication that used to be a basic to search the way to rename Yogyakarta. From this data information also be known the indirect disadvantages faced by the society in handle Merapi eruption.

Conclusions

In any disaster, the need of information becomes critical. At Merapi eruption in Yogyakarta at 2010, e-mail and message about question of location condition, victim condition, searching for families, searching for aid and searching for help. On the other side, the volunteer who try to help also dizzy to search location that need help, searching for the address to send the aid- foods, drugs- searching the disaster location, find the refugee camps. All is mazy and there is no centre information source, no reliable communication.

Jogja Tanggap Cepat is a civil society movement who concern to Merapi eruption with philosophy and solidarity spirit to has mutual sharing and care. The rise of heart, mind togetherness and real movement sees the long impact of Merapi eruption.

Jogja Tanggap Cepat (JTC) is collective-collaborative movement, result from networking of some society elements of Yogyakarta that sought to give best contribution for their own city. They involve and support ‘Jogja Tanggap Cepat’ movement, consist of:

1. PPPI DIY (Persatuan Perusahaan Periklanan Indonesia)
2. KADIN DIY (Kamar Dagang dan Industri Indonesia)
3. IKAPI DIY (Ikatan Penerbit Indonesia)
4. KPID DIY (Komisi Penyiaran Indonesia Daerah)
5. PRSSNI DIY (Persatuan Radio Siaran Swasta Nasional Indonesia)
6. PHRI DIY (Persatuan Hotel dan Restoran Indonesia)
7. Asosiasi Perguruan Tinggi Swasta Indonesia (APTISI)
8. KOPERTAIS wilayah V DIY
9. DEWAN KEBUDAYAAN PROVINSI DIY
10. DEWAN PENDIDIKAN PROVINSI DIY
11. PWI DIY
12. ORARI DIY (Organisasi Amatir Radio Indonesia)
13. AJI DIY (Aliansi Jurnalis Indonesia)
14. Masyarakat Pariwisata Indonesia DIY (MPI)
15. KAMPAYO (Keluarga Artis dan Musisi Panggung Yogyakarta)
16. VEPM (Vendor Elektronik Peduli Merapi)
17. Jaringan Radio Komunitas Yogyakarta (JRKY)

18. Asosiasi Penyelenggara Jasa Internet Indonesia (APJII)
19. JOGJA TV
20. RBTV
21. TVRI Yogyakarta
22. TA TV
23. SONORA FM
24. Kedaulatan Rakyat
25. RADAR Jogja
26. KOMPAS
27. KABARE Magazine
28. CEKIDOT
29. XL AXIATA
30. TELKOM
31. C.59 T-SHIRT
32. SONORA FM
33. SWARAGAMA FM
34. HARIAN BERNAS
35. HARIAN JOGJA
36. BARINDO (Barisan Indonesia)
37. Korp Pemuda & Gempita PMII Fakultas Dakwah UIN Sunan Kalijaga Yogyakarta
38. FL2MI (Forum Lembaga Legislatif Mahasiswa Indonesia) & Tim Relawan dan berbagai pihak lainnya.

The application of disaster management based on information system/TI is not many do yet, so JTC take initiative in handle natural disaster, Merapi eruption in Yogyakarta, by utilizing information system as facility to help the victim and manage the process of distributing the aid for the right target.

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