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Prototype Design of Disaster Management Application Based on Android

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***Abstract*—The development of Information Technology is very fast in the world, including the mobile technology. Mobile is a cellular communication tool provide convenience for all sectors, including government agencies, to be able to produce information quickly, precisely and completely in receiving and conveying information. Indonesia is one of the countries with a relatively high incidence of disasters. In the first week of early 2020, 7 tornado disasters, 5 floods and 1 landslide were recorded, with 23 dead and missing victims, 2 injured and 393 affected. This condition cannot be separated from the geographical factors of Indonesia country, which consists of an archipelago, has active volcanoes, vast oceans and also because of the low behavior of protecting the environment. Almost all parts of Indonesia are susceptible to disasters. Many applications related to natural disaster management have been more developed, but in general the applications have not yet fully reach the needs of stakeholders and victims. So it is necessary to develop an application system for emergency response and disaster management. This study use a prototype model, through the collection of stakeholder needs followed by making a prototype design and evaluation. The application were designed to support various features of the current digital era. The hope, this prototype can be developed to more practical applications in order to facilitate emergency response and disaster management quickly, precisely, and accurately.**

Keywords—prototype design, disaster management, android application

I. INTRODUCTION

The development of information technology is very fast in the world, one of which is mobile technology. Mobile is a cellular communication tool that provides convenience for all sectors, one of which is the government agency that can produce information quickly, precisely and completely in the field of services in receiving and conveying information [1].

Indonesia is one of the countries with a relatively high incidence of disasters. 1 week in early 2020, there were 7 typhoon disasters, 5 floods and 1 landslide with 23 dead and missing victims, 2 injured and 393 affected. This condition cannot be separated from the geographical factors of the country of Indonesia, which consists of an archipelago, has active volcanoes, vast oceans and also because of the behavior of the people who do not protect the environment. So that almost all parts of Indonesia are very prone to disasters [2].

Jember district in 2019 recorded 286 disasters, namely 15 floods, 22 landslides, 86 strong winds, 67 fires, 35 forest and land fires, 39 droughts, 1 abrasion and 21 earthquakes with 30 victims and 3 people died [3]. So it requires special attention in the process of prevention, disaster mitigation and disaster management.

Nationally, there is no complete application to handle the disaster. Disaster management agencies at the central and regional levels in Indonesia are still not ready to handle disasters, especially weak tracing systems. In general, the previous applications have not fully met the needs of stakeholder and disaster victims.

Many applications related to the "early warning system" for natural disasters have been developed, especially applications regarding disaster mitigation. The research study was conducted on a website-based information system for monitoring the distribution of natural disaster assistance [4]. Another study also designed an SMS Autosender and an SMS Autoresponder for a location-based monitoring and search for disaster management volunteers [5]. Post-disaster information system applications have also been designed where at the admin level, inventory logistic data, aid data, volunteer data, victim data have been managed [6]. Post-disaster information system applications have also designed information applications for donors and posts using Android [7]. Existing disaster management applications have not touched victims, victims with emergency condition usually have to wait to get fast and precise treatment. So it is still necessary to develop an application system for emergency response and disaster

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management. Android application innovations that will be developed are application systems in emergency response and disaster management by supporting various features of the current digital era. So the hope is that this application is practical and can facilitate emergency response and disaster management quickly, precisely and accurately.

II. Research Method

The method in this research is using a prototype model, namely gathering needs and making a prototype design. The stage of gathering needs is the collection of materials or data from the research carried out. The first step we conduct a preliminary study at the regional disaster management agency (RDMA), Jember District. Interviewing disaster management program holders, asking about obstacles when evacuating victims.

The research data were also obtained from interviews and literature studies. The prototype design stage consists of the process of making an application flowchart and then evaluating it.

The prototype design was carried out several times, through discussions with RDMA holders. The next step is creating the flowchart. A flowchart is a chart with certain symbols that describe the sequence of processes in detail and the relationship between a process (instruction) and other processes in a program. A flowchart is a symbol diagram that displays data flow and a series of operating stages in a system [8]. The analysis tool used is a flowchart which is a graphical representation of a system or procedure to solve a problem.

Evaluation of the prototype design is carried out in 2 ways, namely users and a team of experts. All input for improvements is made to the prototype design.

III. Result And Discussion

Developing the prototype done for about 2 months, through several trials and redesigns. Especially in feature placement requires input from a team of experts. This placement is of course adjusted to the needs of the RDMA by considering the geographical conditions of the area, the availability of infrastructure in the field and existing human resources.

The application design on this customer menu feature has several functions, namely:

1. Identify the location of the officer who can be used as a tracking officer so that customers can find out the position and location of the officer in carrying out their duties to provide assistance. Every time you open and use the application, a notification will appear on the customer's cellphone to turn on the GPS
2. The victim assistance feature (SOS). The request feature will provide notification to officers so that it can be in detail according to the requests and needs of victims in an emergency situation.

Application design on this Officer menu feature has several functions, namely:

1. The tracking menu feature functions to find out the location and position of the customer if he needs assistance, so that the officer can find out the victim is providing emergency assistance. Officers will pick up or provide assistance to victims quickly and accurately. The officer's cellphone will display a notification to turn on the GPS
2. The disaster report history feature has a function as a disaster report history so that officers know whether the report has credibility or not.
3. The report recapitulation feature has a function as a recapitulation of reports that have occurred so that officers can know that the assistance has been completed.

The application design on this admin menu feature has several functions, namely:

1. User manager (customer and officer) feature which functions to add or delete customer and officer accounts if needed.
2. Recapitulation of disaster reports and activities functions to recapitulate all disaster information and activities that have been carried out by officers. This feature also functions as a quick reporting system if needed by the public or government.

Officer rating feature functions to determine the performance of officers in carrying out tasks in providing services to custumer. The recapitulation results come from the custumer's assessment of the officers.

The Use Case Diagram of disaster management android-based application prototype design is as follows:

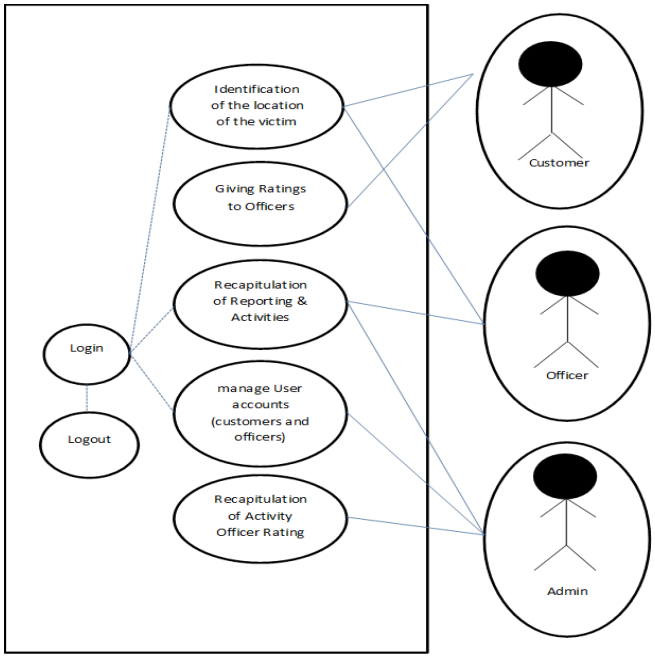

Fig. 1. The Use Case Diagram

The flowchart of disaster management based on android application is as figure 2.

Figure 2 explain the flowchart for disaster management based on Android can be describe as follows:

1. If the customer uses the application the login menu will appear. If the cellphone number has not been registered, a notification will appear to register, if the cellphone number has been registered, a dashboard menu will appear consisting of the SOS Help menu.

2. If the customer selects the SOS help menu, a notification will appear on the cellphone to activate the GPS, so that the tracking feature will be active and usable. Customer can choose a request for assistance. After completing the customer selects assistance, the system will notify the officer to track the location of the officer in carrying out his / her job of providing assistance. Customers can see the officer trip tracking updates. If the officer has finished providing assistance, the customer's cellphone will display a notification of rating feedback to the system which will appear in the admin account.

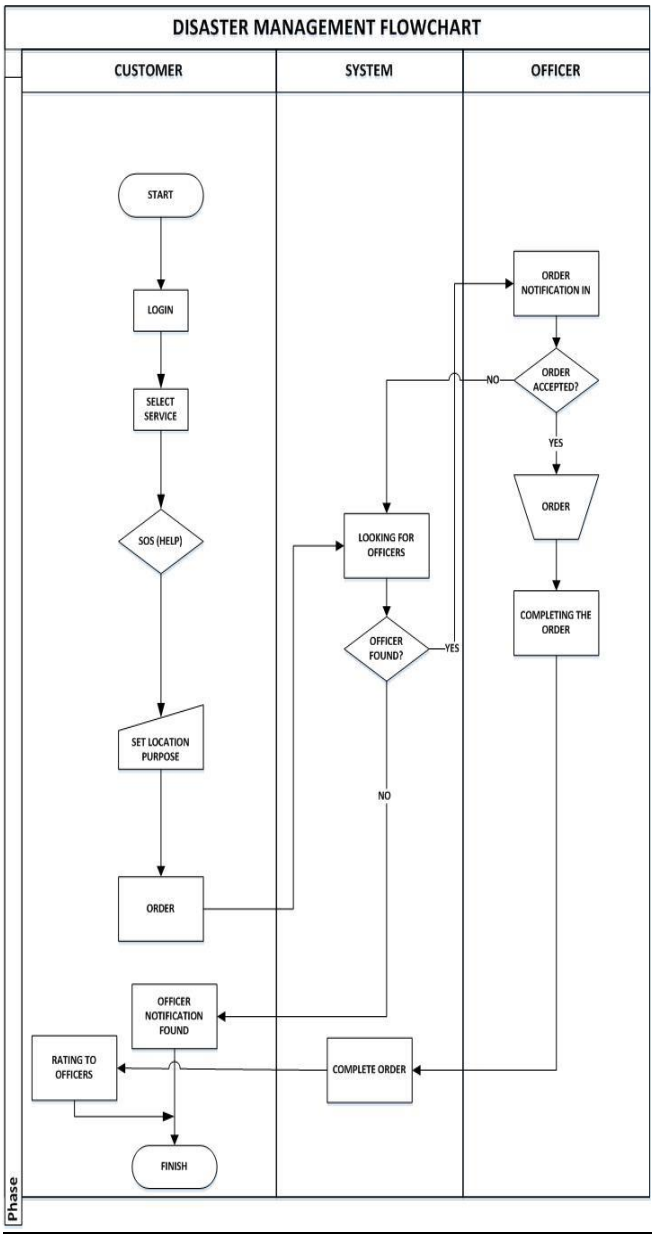

Fig. 2. Design of an android based disaster management prototype

IV. Conclusion

The application prototype design has 3 user applications, namely customer, officer and admin who have their respective functions. The design of this application prototype is expected to get to the next stage, namely the application development stage and evaluation of the application prototype.

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References

[1] A. Alkodri, B. Isnanto, and S. Sujono, "Aplikasi pengaduan masyarakat untuk pelaporan kejadian dan bencana di basarnas bangka belitung," in Seminar Nasional Sitem Informasi dan teknik Informatika, 2019, pp. 15–20

[2] BNBP, "Data Bencana di Indonesia," Jakarta, 2019. Accessed: Mar. 28, 2020. [Online]. Available: https://bnpb.cloud/dibi/

[3] B. Supriadi, "286 Bencana Terjadi di Jember Sepanjang 2019, 3 Tewas," 2020. https://regional.kompas.com/read/2020/01/07/10323591/286-bencana-terjadi-di-jember-sepanjang-2019-3-tewas (accessed Mar. 15, 2020)

[4] S. Nurhayati and L. F. Waha, "Pemodelan Monitoring Distribusi Bantuan Bencana Alam Berbasis Website," *J. Sist. Komput. Unikom*, vol. 1, no. 2, pp. 1–7, 2012

[5] K. Anindito, D. Indriasari, E. Julianto, and H. Yanita, "Pengembangan Aplikasi SMS Autosender dan SMS Autoresponder untuk Sistem Pemantauan dan Pencarian Relawan Penanganan Bencana dengan Basis Lokasi," *Pros. Semin. Nas. XI "Rekayasa Teknol. Ind. dan Inf. 2016*, pp. 56–61, 2016.

[6] R. Kartadie, F. Asharudin, T. Suryanto, and ..., "Aplikasi Sistem Informasi Manajemen Penanggulangan Pasca Bencana," *Semnasteknomedia Online*, pp. 137–142, 2013, [Online]. Available: http://ojs.amikom.ac.id/index.php/semnasteknomedia/article/view/651

[7] I. Y. Setiawati, A. Handojo, and A. N. Purbowo, "Aplikasi Informasi Posko Bencana Alam Berbasis Android," *J. Infa*, vol. 3, no. 2, pp. 297–302, 2015

[8] W. Nugroho, *Sistem Informasi Akuntansi*. Erlangga, 2001