



Design and Development of Bungo Emergency Service (BES) System Information 119 Android-Based

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Abstrak

Emergency services are very important things to consider. One of the factors that influence the quality of pre-hospital emergency services is the response to the handling of victims. With the advancement of information technology that is developing at the time, especially applications in smartphones that are very advanced and can be synergized with the needs in the pre-hospital emergency service system. The problems that have occurred so far in emergency services are the length of response time of finding the location of the victim and the destination location referring to the nearest health facility. The purpose of this research in to make it easier for the public to request medical emergency assistance to Bungo Emergency Service (BES) 119. This type of research is qualitative and quantitative. by using the the one group pre and post test research design, the method used in developing system is FAST (Framework for Application of System Engineering). Subjects in the study were 2 Village Midwives, 2 Ambulance

Drivers, and 5 respondents who worked at Public Safety Center 119.

The method of data collection in this study by means of observation and interviews, then analyzed by the method of content analysis and descriptive analysis using a weighted average. Descriptively, the results of the analysis are the weighted average value of overall information quality before system development 1.78 and after system development 3.65 with a difference of 1.87. Calculation of response time service to victims is 5.4 seconds faster.

The results of this study concluded that there was an increase in the quality of information systems before and after the development of a new system, support and commitment are needed from the Public Safety Center 119 of the Bungo District Health Office to implement the Bungo Emergency Service 119 information system optimally. Periodic monitoring and evaluation of system users must be carried out by the 119 Public Safety Center and Bungo District Health Office.

Keywords: System Design, Bungo Emergency Service (BES), Fast, android.



I. INTRODUCTION

By With the increasing number of emergency cases in the Indonesian, government issues Regulation of the Minister of Health of the Republic of Indonesia Number 19 of 2016 concerning the implementation of the Integrated Emergency Response System. The aim is to improve access and quality of emergency care services and speed up the handling time (response time) of Emergency Victims and reduce mortality and disability. [1]

To improve public services, the Regional Government makes an innovation. This is case is regulated through the Republic of Indonesia Government Regulation No. 38 of 2017 concerning Innovation. is is purposed to improve the performance of the Regional Government and Public Services in the health sector in Indonesia. This case is very important regarding to the geographical conditions among regions, inadequate facilities and medical personnel making health services have their own constraints in the distribution of health services. [2]

In order to realize public services in the health sector, the Government through the Ministry of Health in 2013 made a breakthrough Public Safety Center (PSC) 119 where each region must establish a PSC 119. Because the regional capacity in terms of funding is not the same, the PSC 119 program does not work well. This matter is due to the high cost of hardware, software and etc. Therefore, regions must innovate so that public services continue to run. The innovations made are: designing an Android-based Bungo Emergency Service 119 information system.

II. LITERATURE REVIEW

2.1 Bungo Emergency Service (BES) 119

Public Safety Service (PSC) is an integrated service center that guarantees the needs of the community related to the emergencies, including medical services that can be contacted in a short time wherever they are. It is the spearhead of the service that aimed to get a quick response, especially pre-hospital services. [3].

Bungo Emergency Service (BES) 119 is a pre-hospital emergency service center that has a fast, precise response and can be contacted anytime, anywhere in a short time which aimed to provide first aid to save the lives of victims and prevent disability.

BES 119 is a service center that guarantees the needs of the community related to the emergencies in the district / city that works as a spearhead of service to get a quick response. An important component for the implementation of the BES program is needed for a system including internal legal regulations, call centers, coordination lines / SOPs, policies of each Regional Work Unit (SKPD), cooperation networks and matters relating to the coordination needs including collaboration with cross sector or other related agencies and BES financing mechanisms. Other components are human resources and infrastructure facilities for the realization of this BES program. This service is oriented to the pre-hospital emergency services, so that individuals or communities who get injured could get emergency care help at the place as soon as possible before getting professional services at the hospital. [1]



2.2 Framework for the Application of Thinking System (Fast)

The Fast method is a methodology used to develop and maintain an information system. According to (Jettery L, Whitten 2011) the Fast method starts from the System Analyst Software, Engineers and Programmers. To build a system there are several stages, such as the preliminary study phase, problem analysis, needs analysis, logical design, decision analysis, physical design & integration, construction & testing, installation & delivery. [5]

2.3 Android

is an operating system on cellphone based on linux which has an open platform. In the Andoid system we can develop and create our own applications that can be used in mobile devices

III. RESEARCH METHODS AND DESIGNS.

3.1 Research Sites

The research began on February 21 until March 21, 2019, by conducting a preliminary study first on November 18, 2018. This research has stated its feasibility and obtained approval from the ethics committee of the Diponegoro University Faculty of Public Health Semarang by Number. 37 / EA / KEPK-FKM / 2019.

3.2 Research Design

The methodology used in the Bungo Emergency Service Information System (BES) 119 uses *the Fast method*. The stages in *the Fast method* consist of seven stages: preliminary studies, problem analysis, needs analysis, logical design, decision analysis, physical design & integration, construction & testing, installation & delivery. [5]

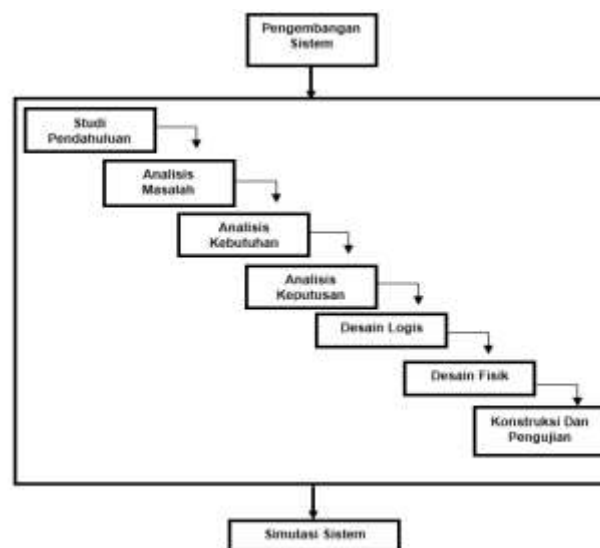


Figure 1. Conceptual Framework



3.3 Research Subjects

The subjects of this study are all officers related to the Bungo Emergency Service Information System 119 in the Public Safety Center 119 Bungo District Health Office, those are: 1 Head of Health Section and referral, 1 PSC Coordinator, 1 Admin Officer, 1 PSC doctor, 1 Nurse, 2 ambulance drivers and 2 village midwives.

3.4 Data collection Types and techniques

This type of research is qualitative and quantitative. Qualitative design is carried out to simplify the identification process at each phase of system development, so that an Android-based Bungo Emergency Service Information System 119 is formed at the Public Safety Center 119 Bungo District Health Office. Quantitative methods are used to evaluate the quality of information. The design of the study uses one group pre and post test, that is the research design carried out to measure one group or object before and after treatment.

Data collection is performed by observing and in-depth interviewings using questionnaires (Suheri, 2017) [13]. Processing data from questionnaires is processed into quantitative data using a Likert scale so that numerical data is obtained to facilitate the calculation of the weighted average.

3.5 System Design

System design in this study starts from database design. According to. [6] The database is the most important component that functions to support information systems. The next stage is data normalization, making Context Diagram, Data Flow Diagram (DFD) and Entity Relationship Diagram (ERD), [7]

Then a system simulation is performed. Data Flow Diagrams (DFD) or Data Flow Diagrams (DAD). DFD is a series of diagrams that describe the activities that exist in a system wherein there is a link between existing data. The DFD manufacturing technique is illustrated with context diagrams or DFD level 0 and continued with analysis of each part, those are DFD level 1, DFD level 2 and so on. [8] On the other hand, Entity-Relationship Diagram (ERD) is the initial modeling of database structure that will be developed to answer relationships among other data. [9]

3.6 Results Analysis Techniques

From the results of the BES 119 information system simulation that was built using the Fast method, the in-depth analysis is carried out. Conclusions will be obtained from the results of research. [10]

IV. ANALYSIS RESULTS AND SYSTEM DESIGN

4.1 Analysis Results of System Design

The first step in designing BES 119 information systems is to conduct problem analysis and needs analysis. This case is done through an in-depth interview and research location by interviewing and observing conducted in accordance with the needs in



designing the BES 119 Information System. This case can be seen from the current BES 119 system flow. Therefore, it is necessary to have more systematic and structured steps to design new information systems. From the stages and results of the analysis, it is known that a computerized BES 119 information system from the user, admin and network is needed to improve the quality of referral services and Response Time for handling victims of emergencies so that victims can be referred quickly and precisely to the nearest health facility.

The design of this system is built with the Java Script programming language and its database using Firebase. This system is developed based on Android and Wab. Firebase is a service from Google that is used to simplify developing applications, as well as facilitating the system design process. Therefore, it is necessary to establish relationships with entities and attributes used, along with flow and system processes used in the system. Then, it is necessary to design an ERD, context diagram and DFD. [11]

As for The ERD in the information system for Bungo Emergency Service 119, it can be seen in Figure 2.

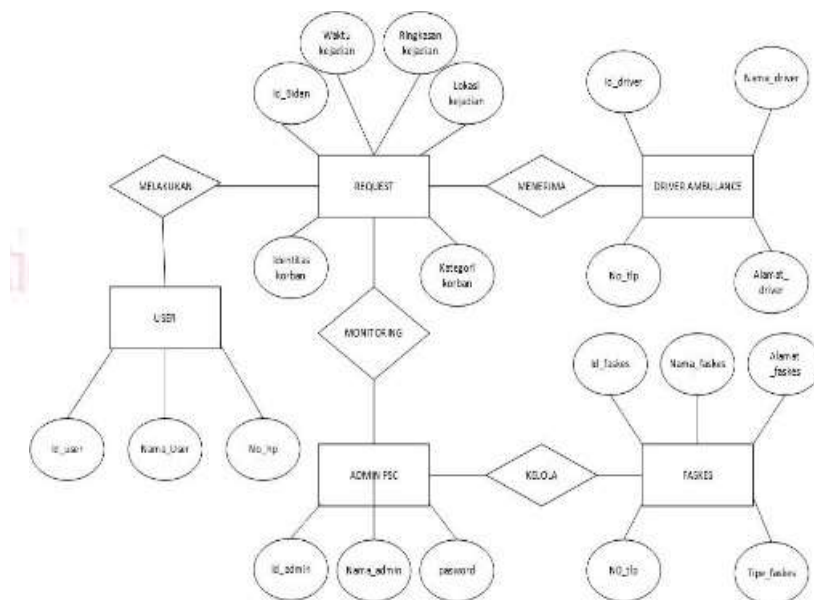


Figure 2. ERD BES 119

Figure 2 Describes the description of the relationships and entities that exist on the BES 119 system. Then a context diagram is made to explain the data and information that enters and exits the system. This matter can be seen in Figure 3.

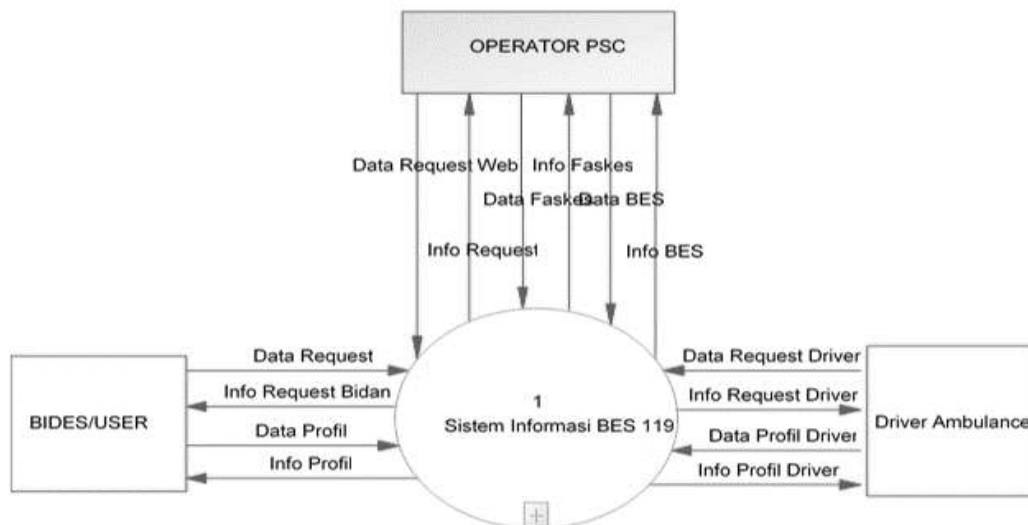


Figure 3. Context Diagram.

An overview of data relations on the system and processes that occur in the system can be seen in Data Flow Diagram (DFD) data. [8] Can be seen in Figure 4.

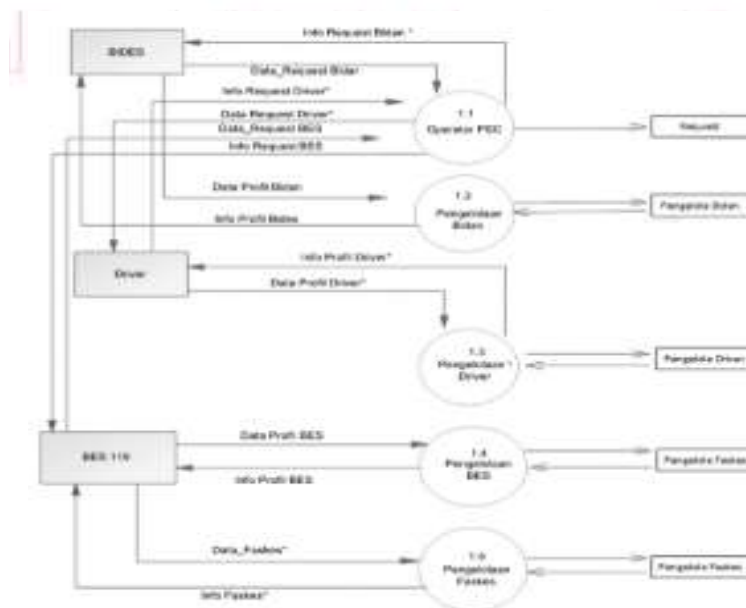


Figure 4. DFD



4.2 Results of System Design

User Interface is a graphical display that can be understood by computer users and programmed in such a way that it can be read by the computer's operating system and operates properly. With a user interface, users can easily input and output data and manipulate / manipulate data as needed. [12]

Next is the BES 119 Information System Interface user based on Android. The inter-design on this system uses Bootstrap. The BES 119 user interface is designed using two platforms, those are Wab and Android. The android platform consists of two levels of users including User and Driver ambulance while administrator is based on Wab. The interface design can be seen in figure 5 to 20.

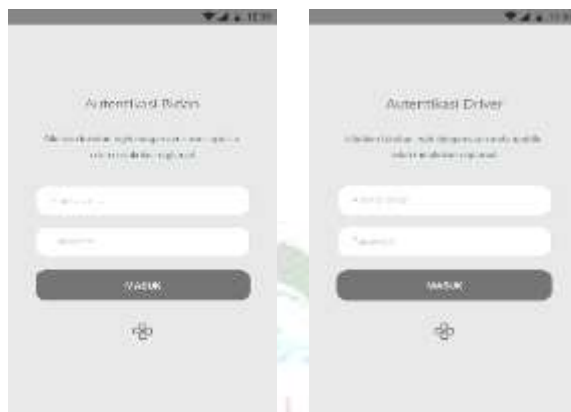


Figure 5 User and Driver login page

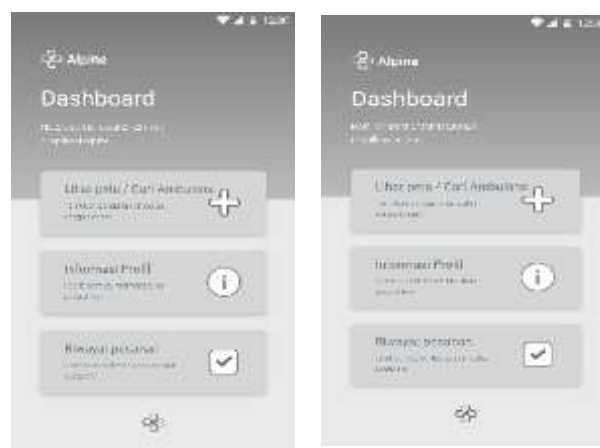


Figure 6. User and Driver Dashboard page

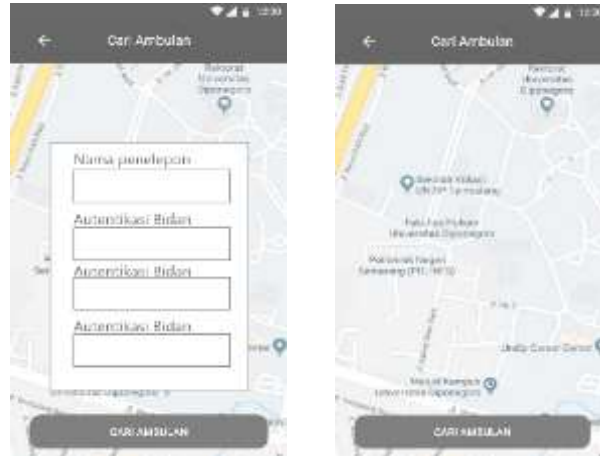


Figure 7. Search for Ambulance User Menu



Figure 8. User and Driver Profile Menu

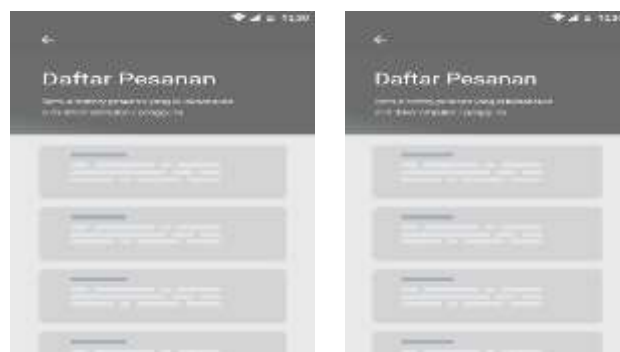


Figure 9. Order History Menu



Figure 10. Driver Status



Figure 11. river Order History Details



Figure 12. Dashboard Page

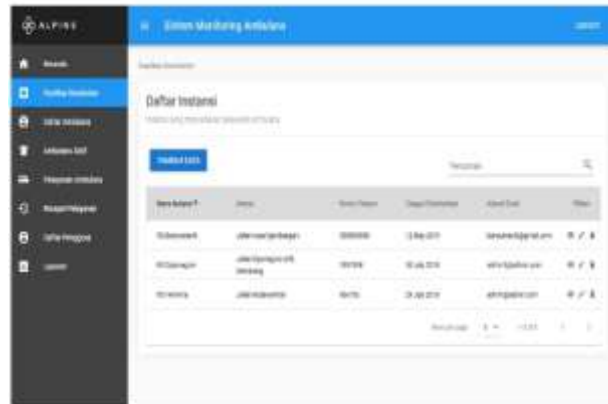


Figure 13. List (Menu) of Health Facilities

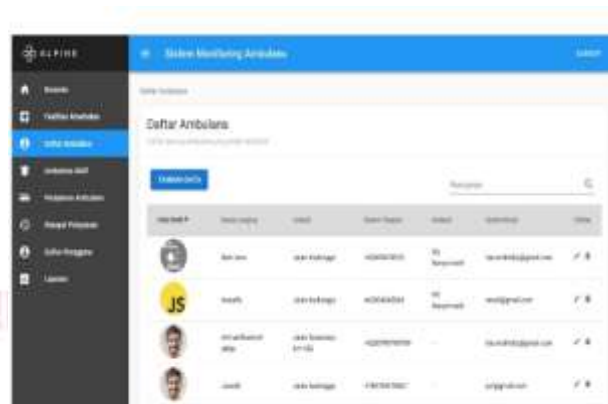


Figure 14. Display Ambulance List Menu

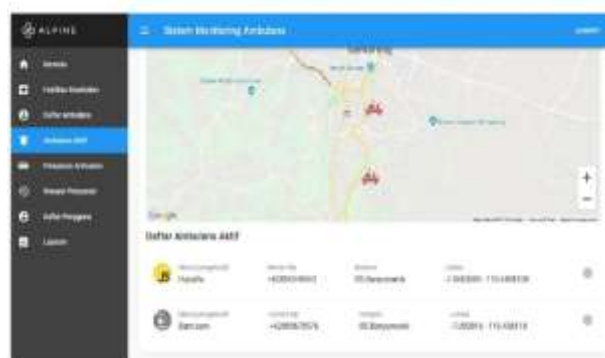


Figure 15. Active Ambulance Menu Display

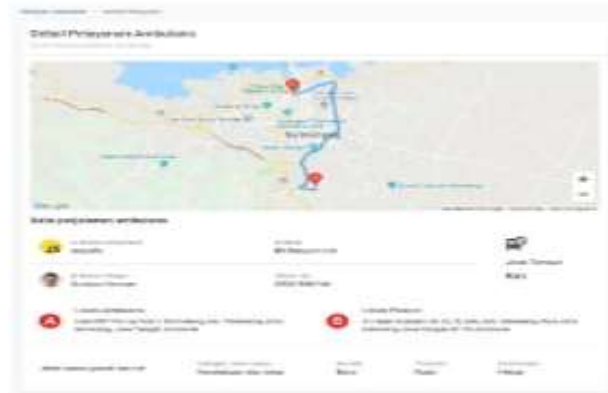


Figure 17. Ambulance Service Menu.

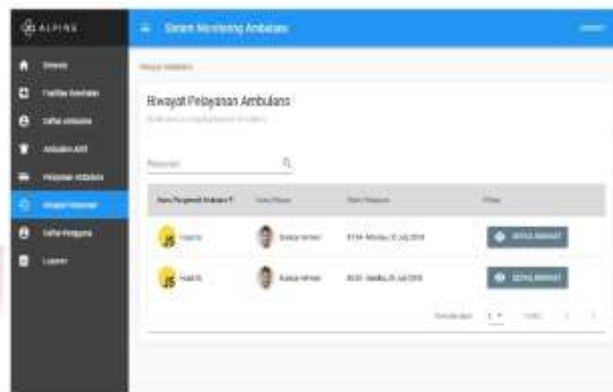


Figure 16. Display Service History Menu

4.3 System Testing and Simulation

Before testing the new system, users of the system are asked to fill in questionnaires to measure the quality of information systems on the system before executing the development. The way to fill in is by entering values from one to four next to the question. Each score has its own meaning, those are: 1 = Strongly Disagree 2 = Disagree, 3 = Agree and 4 = Strongly agree. After testing the Bungo Emergency Service Information System 119, then the user will be asked to fill in a new closed questionnaire again to find out and measure the quality of the new information system with the same procedure as well as testing the quality of the old information system. Then the value of the difference in the quality of information is calculated before and after development using the Linker Scale.



Table 1 Results of Information Quality Measurement Recapitulation
Before and After Development of Adroid-Based Bungo Emergency Service 119 Information
System at Bungo District Health Office Public Safety Center.

Variable	Before The Development	After The Development	Difference in Average	Value p (sig)
Completeness	1.76	3.72	1.96	0,000
Ease of Access	1.58	3.58	2,00	0,000
Conformity	1.96	3.63	1.67	0,000
Accuracy	1.92	3.63	1,71	0,000
Timeliness	1.67	3.67	2.00	0,000
Overall Average	1.78	3.65	1.87	0,000

On the other hand, with the existence of these systems the service becomes more effective and efficient, because it can speed up service response time compared to before performing system development. Weighted Average Value Evaluation Results of Completeness, Before the System is developed to 1,76 And after developing the system of 3.72. From the values above can be drawn the conclusions that Data and Information generated after the development of the system is better than before the development of the system with the difference in the average value weighted average of 1.96.

For easy access to the weighted average value, before the system is developed to 1.58 and after the system is developed to 3.58, therefore, from the previous value, it could be concluded that the ease of access to data and information produced became better after the system is developed than before the system is developed with a weighted average value of 2,00.

For the suitability of the weighted average value before the system is developed to 1.96 and after the System is developed to 3.68, then from this value, it can be concluded that the suitability of information after system development is better than before the system was developed with the difference in the weighted average value of 1.67.

For accuracy criteria the weighted average value before system development 1.92 and after system development 3.63, then from these values can be concluded that the accuracy of data and information after system development is better than before the system development with the difference in weighted average values is 1,71.

Timeliness of weighted average values before system development 1.67 and after system development 3.67, so, based on these values it can be concluded that the timeliness of data and information, after system development is better than before the system development with the difference in weighted average values is 2.00.



Table 2 Calculation Results of Response Time Required for Bungo Emergency services Service 119 toward several victims before and after the system development

Process	Average service time needed (minutes)		Average difference
	Before system development	After system development	
Response Time	10,2 seconds	4.8 seconds	5,4 seconds

From the table above, it can be seen that before the system is developed, The Public Service Center 119 service time response is 10,2 seconds and after the system is developed the response time becomes 4.8 seconds. From the average value difference, it can be concluded that the service response time at Public Safety Center 119 increased by 5,4 seconds after system is developed.

V. CONCLUSION.

The quality of information systems produced before performing the system development is still has several weaknesses, such as aspect of data completeness, ease of access, data suitability, data accuracy and timeliness in terms of recording and reporting. From the results of trials conducted on the new system, it shows that the new system is able to overcome the problems that exist in the old system. This can be seen from the respondent's answer in terms of completeness, convenience, suitability, accuracy and timeliness in reporting. This can be seen from the results of the overall weighted average recapitulation which shows an increase in yield from 1.78 to 3.65 with the difference in the overall weighted average of 1.87.

After performing the development of a new system, the Response Time Public Safety Center 119 increased from 10.2 seconds to 4.8 minutes, making it 5.4 seconds.faster.

VI. ACKNOWLEDGMENTS

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