ISSN : 1978-8282, Online ISSN: 2655-4275

Application for Reporting Damage to Roads & Bridges at UPT DBMSDA Tangerang Regency

Desy Apriani*[1], Syafira Viglia Zumadilla[2], Ginanjar Putro Wicaksono[3]
[1,2,3]Informatics Technology Study Program Faculty of Science and Technology
Raharja University
E-mail: *[1]**desy@raharja.info**, [2]syafira.viglia@raharja.info, [3]ginanjar.putro@raharja.info

Abstract

The development of special science and technology of the internet has developed very rapidly and provides very significant developments in our daily lives. In addition, the presence of technology in the company's environment is also familiar. Overcoming the Internet in various fields. The more rapid technology drives the company or more optimal in its performance. This discusses the Tangerang District Water and Water Resources Office as an institution engaged in the service and community sectors to improve the road and bridge reporting system to create more effective and efficient performance. The UPT of Binamarga Service and Water Resources of Tangerang Regency still has various problems, the difficulty in reporting road damage is less fast and less accurate the process is still manual. This research uses the SWOT method, system requirements determination and system modeling using UML (Unified Modeling Language) to describe the visualization, and then uses the MySQL-Server database as the database to implement the hypertext preprocessor (PHP) programming language. Therefore, it is necessary to improve the system to use the Tangerang District Water and Water Resources Service in reporting damage to roads and bridges so that the Tangerang District Water Service and Water Resources Department can immediately display and process the approved reports to assist the DGH sector.

Keywords *— UPT of Bina Marga Office and Water Resources of Tangerang Regency, Reporting, Public Works Agency*

1. INTRODUCTION

The very rapid development of information technology, which is encouraged by the entry of the internet, has advanced many areas of life to make optimal use of this technology. The use of information technology that develops in aspects of government life is expected to bring benefits in strengthening the community through increasing information and services, as well as improving more efficient government governance.

The facilities and infrastructure in Indonesia are still considered not satisfactory. The condition of the road sections that often suffer from low, moderate and acute levels of damage due to the quality of the road that is not up to standard, either due to the wrong working method or the material used, the absence of a water channel that allows water to flow directly without having to stagnate the road, also with less maintenance. The role of the government regarding roads is very important, with the aim of positioning the government as part of the national level that functions to provide public services effectively, efficiently and economically.

The Bina Marga Office is one of the Regional Apparatus Work Units (SKPD) within the Banten Provincial Government Organization which is tasked with serving the community in providing DGH infrastructure. The current condition of the Bina marga office is still inefficient, especially in reporting damage to roads and bridges which still use paper documents and analog maps for road displays for surveys. In the current era of information technology, the need for a computerized system requires spatial data that can describe well-monitored road conditions. The data will be processed into an orderly summary into an information system which is expected to provide service to related agencies and the government. In addition, it is hoped that this will help in the road improvement plan to make it more structured and expandable. Based on the description above, the authors are interested in analyzing the Damage Reporting Information System for Roads and Bridges at the Highways Office. For this reason, researchers took the title "**Application for Reporting Damage to Roads & Bridges at UPT DBMSDA Tangerang Regency** ".

2. RESEARCH METHOD

In carrying out this research, researchers used several research methods on the company in finding and collecting precise and accurate data. The methods in data collection are as follows::

2.1. Method Of Collecting Data

In carrying out this research the authors used the following data collection methods:

1. Observation Method

Initially, it was carried out by thoroughly observing the system that was running in the process of reporting damage to roads and bridges, then studying the existing deficiencies, after taking temporary conclusions about the problems that existed as a whole and defining the problem.

2. Interview Method

The method used to obtain data and information about company data is through interviews with the planning department or by asking questions and answers.

3. Library Study Method

The method of conducting literature research is to support the interview and observation methods that have been conducted. The author collects information through literature and Internet resources by reading and researching several books on the research theories discussed in this report.

2.2. Analysis Method

Data analysis is used to obtain the data needed to prepare the report. In this case, the data analysis uses the SWOT analysis method (strengths, weaknesses, opportunities, threats). SWOT analysis is a method used to view the water resources of UPT Dinas Binamarga and Tangerang Regency both internally and externally. This method can then be used to identify their strengths, weaknesses, opportunities and threats, thereby helping to make decisions.

2.3. System Design Method

The design method uses a unified modeling language (UML) tool with Visual Paradigm for UML 8.0 Interprise Edition software, which will go through the use case diagram, class diagram, sequence diagram and activity diagram stages.In designing the system that will be made the author uses the elicitation method to collect and select what the system needs. Elicitation is a system design required by the user. The description of database design and data specifications, which uses several software in the design, including: Sublime Text 3, PHP MyAdmin, Apache, MYSQL, Visual Paradigm, and Chrome.

2.4. Testing Method

The design testing phase is in the form of a program that is ready to operate. Researchers use the Blackbox Testing method where this method can detect or find out errors in system functions and whether the system is running well.

2.5. Literature Review

Literature review is a theoretical framework of research topics/fields, which contains descriptions of theories, findings, and other research materials obtained from reference materials as the basis for research activities. Some review documents are as follows:

1. The research in this thesis was conducted by Ifoh Basaria from Raharja University (2016), entitled "Designing Information Systems for Road and Bridge Development Planning at the Department of Binamarga and Water Resources in Tangerang City". This study aims to facilitate the planning and monitoring of road and bridge construction by Binamarga and the Ministry of Water Resources in Tangerang City, so that Binamarga and the Ministry of Water Resources can make immediate decisions based on the existing budget and conduct good monitoring and planning on them.
2. Research conducted by Aris, Tiya Puspita Firdaus, and Nesa Nurseha (2018) entitled "Application of the Quality Control Program for Goods to Support Reporting in the Engineering Section of Raharja Higher Education". Need easily accessible data and information to support the performance of each part. As with the "engineering" part, in data processing, the "engineering" part still cannot provide the best service to meet the strategic information needs to support reporting to the management department of Raharja College.

3. Research conducted by Giandari Maulani, Kartika Chandra Buana Sejati and Zahrotul Hayati in the Journal of Informatics Vol. 2 No. February 1 (2016) STMIK Raharja, entitled "Information Systems Management of Production Report Data Based on Website at Pt. Nikona Graha Tangerang". In the production report data management performed by the production department, there are still some defects, that is, the production department still uses paper to record the production report process, and cannot enter the production result report on the same day, because the production result report is recorded in the production result table . Using paper, it will take a long time to process the data, and the data storage is still not safe and well organized, because there is no good data storage area, for example, paper production reports stacked on the table will be lost and may lead to production The report is missing. Mixed with the entered production report.
4. Research in a journal conducted by Rinaldy Maulidiansyah, Deny Fauzy Rakhman and Muhammad Ali Ramdhani (2017) from the State Islamic University of Sunan Gunung Djati Bandung, entitled "Application for Reporting Toll Road Damage Using Android-Based WEB Service Services". This study aims to implement a web service with the REST (Representational State Transfer) method on Android-based mobile devices. The result of this research is to send reports of road damage via a mobile device to a database on the server by utilizing a web service.
5. Research in a journal conducted by Christine Dewi and Anjar Widhyo Sasongko (2018) from the Christian University of Satya Wacana Salatiga in the Indonesian Journal Of Computing and Modeling, entitled "The Infrastructure Reporting System for the Office of Highways and PSDA for the City of Salatiga Using Web-Based NodeJs". This study aims to create a system that facilitates the work of the service officers and resolves the problem of data collection and processing the distribution of infrastructure problems in the DGH and PSDA Salatiga City offices.
6. Research in a journal conducted by Daniel Oktodeli Sihombing (2016) from the Christian University of Satya Wacana Salatiga in the Indonesian Journal Of Computing and Modeling, entitled "Designing Community Reporting Information Systems for Street Damage in Pontianak Using Google Maps Api". This study aims to provide information about the damage to this road so that it can be a guide for motorists to be careful in driving and it is hoped that it can also be a consideration for immediate repair for the local government so that driving smooth and safe can be created. The feature of this road damage mapping information system is designed in a simple form so that people can see information on which roads have damage and can send information on road damage they see.
7. Research conducted by Kim, Yongjae Jung, Haekook Kim, Seungwon Park, Cheolwoo Kim, Yongjae Jung, Haekook Kim, Seungwon Park, Cheolwoo in the International Journal of Highway Engineering (2018) entitled "Emergency and Permanent Repair Technology for Damaged Road Bases and Slopes using Gravel-Netting Concrete ". Worldwide, the frequency and severity of natural disasters such as heavy rains or typhoons have become increasingly important. Events such as summer typhoons and local downpours may cause serious damage to residential areas and road networks, and seriously endanger people's daily lives, especially in rural areas, isolating residents from the road network. There is an urgent need for instant emergency repair

technology for the collapsed road network. This research introduces a new technique to repair roadbeds or slopes.

3. RESEARCH RESULTS AND DISCUSSION

3.1. SWOT Method Analysis

This study uses SWOT analysis methods to assess the strengths, weaknesses, opportunities, and threats of the current reporting system so that information about the current reporting system can be communicated to the UPT department of Binamarga. This.

Then an analysis is carried out to find a strategy using the SWOT matrix. This SWOT matrix can clearly describe how the available opportunities use (SO strategy) and use the strengths they have to overcome a threat using (ST strategy) and also analyze strategies to reduce weaknesses to seize existing opportunities using (WO strategy) and overcome existing threats by using (WT strategy). The following is a SWOT analysis table on the road and bridge damage reporting system at the UPT Dinas Bina Marga Tangerang Regency:

1. Strength

Strength is an internal and positive point of the company. These are things that are under control.

Tabel 1. Strength

Strength
1. There are computer facilities and supporting facilities such as internet access 2. Human resources who are qualified in the basic field of computers.
SO
1. Creating a web-based computerized system that can help Sub. 2. Design information systems, especially in the process of providing information services to the public.

2. Weakness

Weakness is an unfavorable factor in reducing strength. These are things you may need to improve to increase your competitiveness.

Table 2. Weakness

Weakness
1. Still using paper media as a transaction tool 2. Damage reporting data is irregularly placed. 3. Takes time in processing report data. 4. Frequent errors in the reporting process such as double data that have been reported or have not been reported.
WO
1. Optimization of existing technology tools. 2. Creating a system that can generate reports automatically.

3. Opportunity

Opportunity is an external factor in the business environment and often contributes to business success.

Table 3. Opportunity

Opportunity
1. Has sufficient budget for development in the field of information and communication. 2. Utilizing the available facilities as a support in creating a computerized system
ST
1. Creating a web-based computerized system that can help Sub. Planning section in compiling reports. 2. Designing information systems, especially in the process of providing information

4. Threats

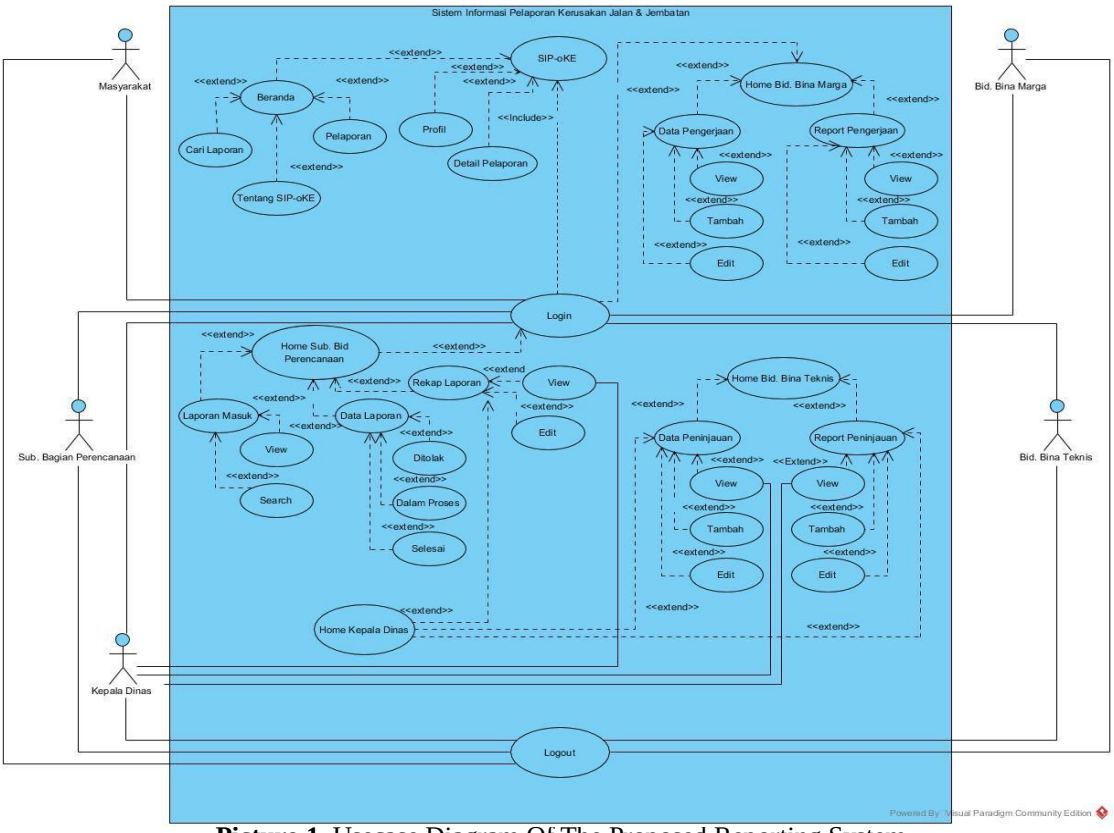
Threats are external factors that cannot be controlled. When dealing with problems that arise, we must still take this into account and make contingency plans.

Table 4. Threats

Threats
1. Risk of human error 2. Risk of lost files 3. Loss of damage reporting data due to system disturbances in operational devices or poor filing processes.
WT
1. Optimization of existing technology tools. 2. Creating a system that can generate reports automatically.

3.2. Proposed Usecase Diagram

The use case diagram describes the expected functionality of the system. The system emphasizes "what", not "how". The use case system proposes the interaction between participants and the system. The following is the use case diagram proposed in the road and bridge damage reporting system:

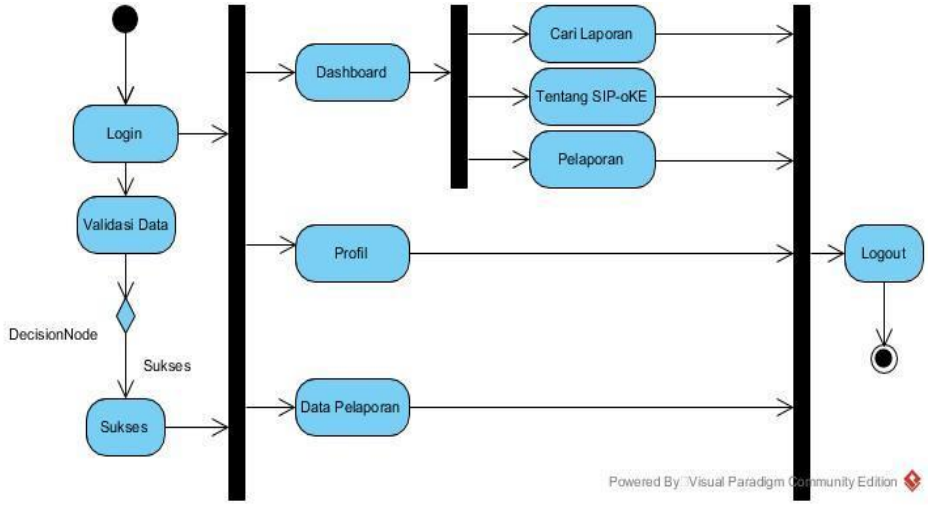


Picture 1. Usecase Diagram Of The Proposed Reporting System

3.3. The Proposed Activity Diagram

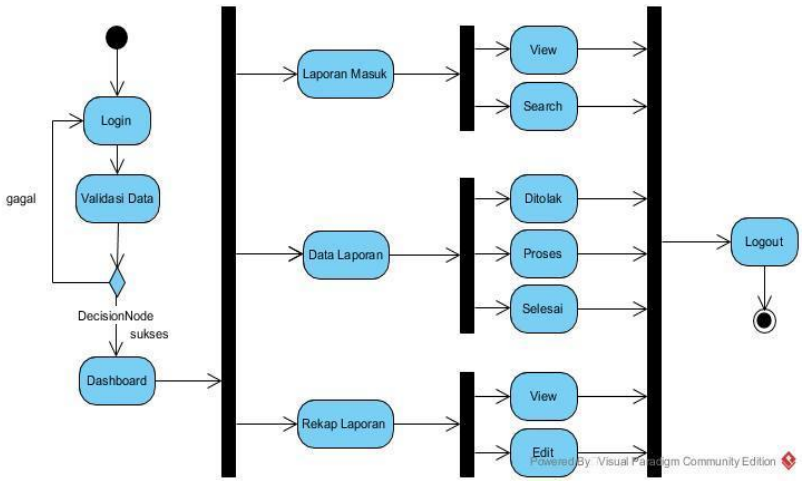
The activity diagram describes the various activity flows in the system being designed, how each flow starts, possible decisions that may occur, and how the system ends. In addition, activity diagrams can also describe parallel processes that may occur in several executions. The following is a diagram of activities performed by multiple participants in the proposed system, including:

1. Community Activity Diagram



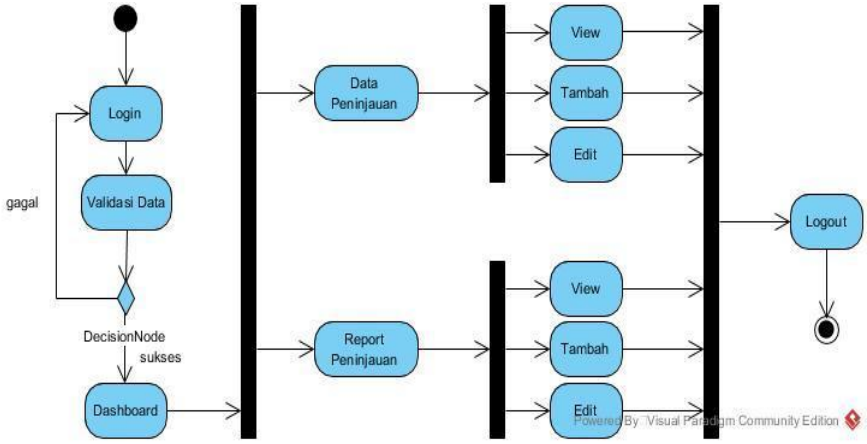
Picture 2. The proposed Community Activity Diagram

2. Activity Diagram Sub. Planning Section



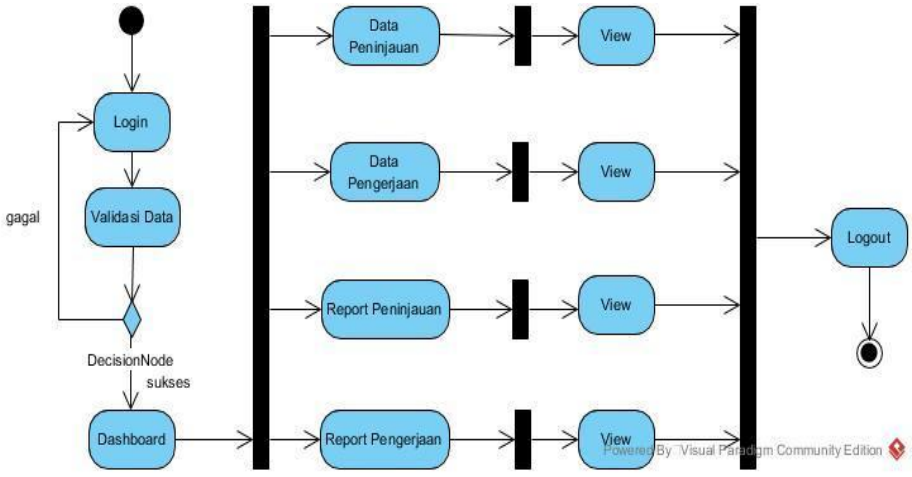
Picture 3. Activity Diagram Sub. The proposed Planning section

3. Activity Diagram Bid. Technical Development



Picture 4. Activity Diagram Bid. Bina Teknik The proposed

4. Activity Diagram Head of Department

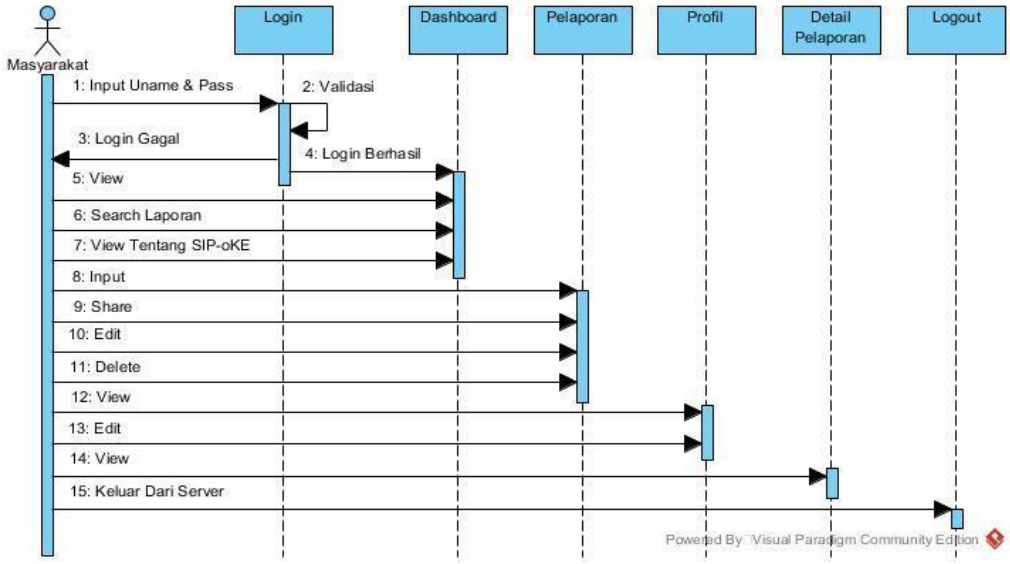


Picture 5. Activity Diagram Head of Department The proposed

3.4. Proposed Admin Sequence Diagram

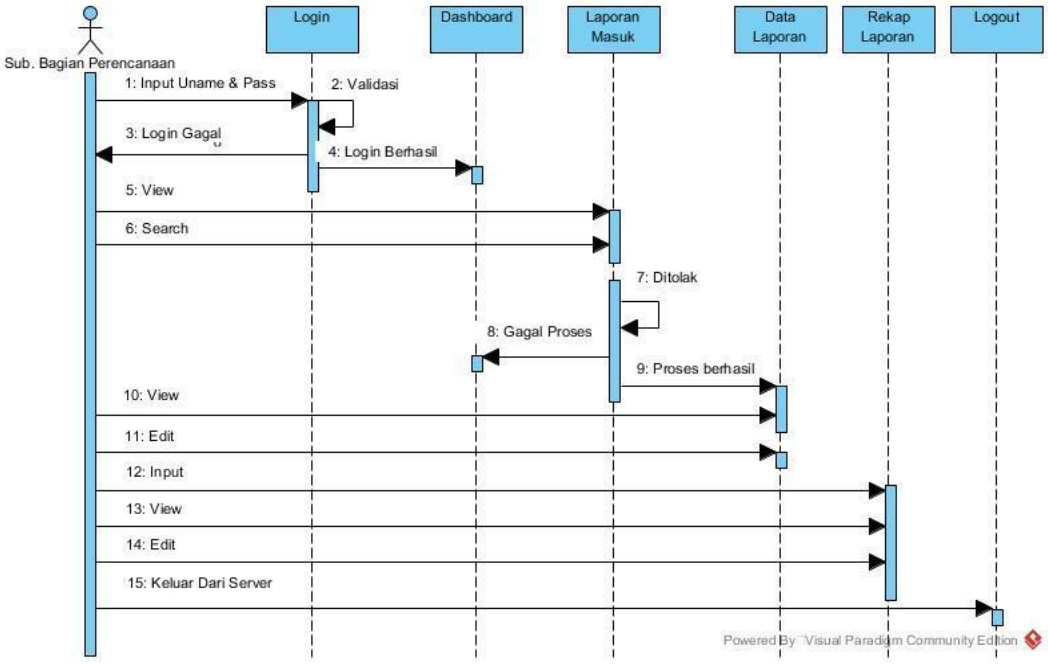
Sequence diagrams between objects in and around the system (including users, etc.) in the form of massage drawn against time. Sequence diagrams consist of vertical dimensions (time) and horizontal dimensions (related objects. The following is a Sequence Diagram that was carried out by several actors in the proposed system, including:

1. Community Sequence Diagram



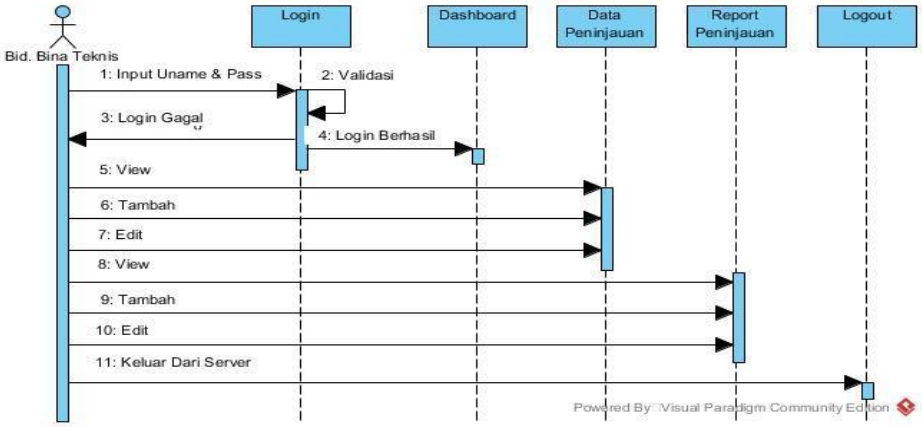
Picture 6. The proposed Community Sequence Diagram

2. Sequence Diagram Sub. Planning Section



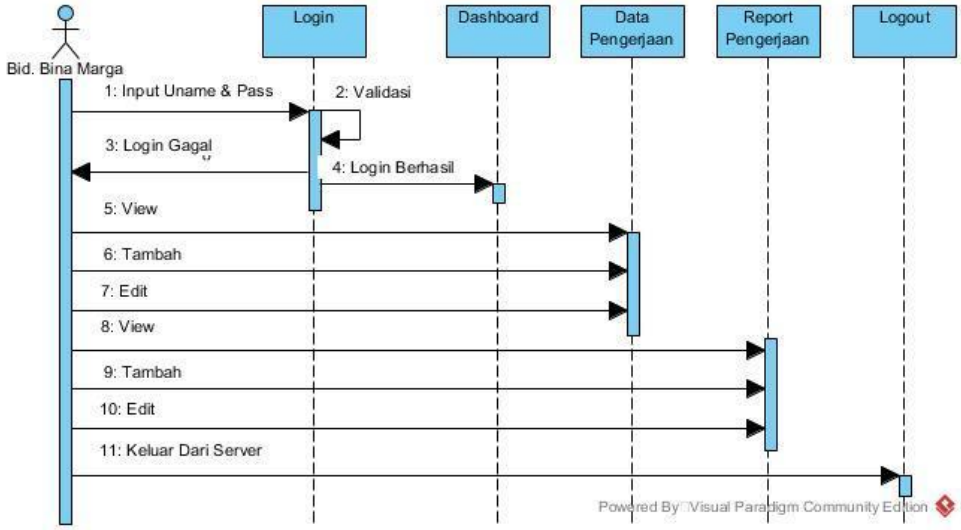
Picture 7. Sequence Diagram Sub. The proposed Planning section

3. Sequence Diagram Bid. Bina Teknis



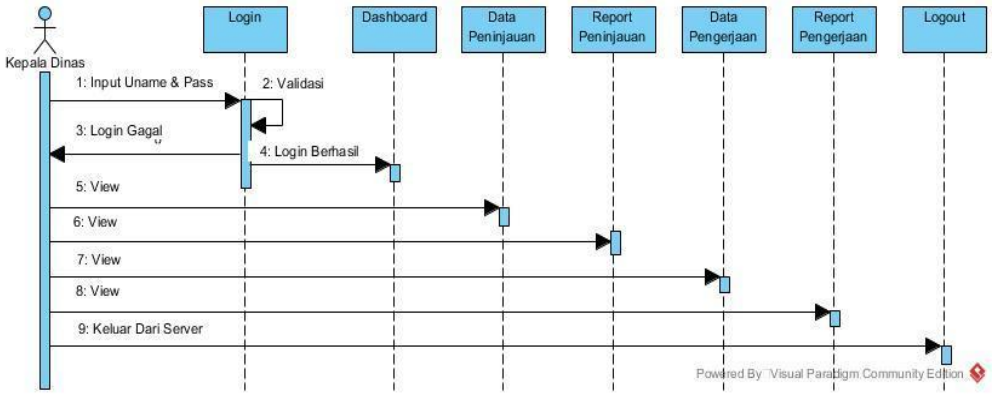
Picture 8. Sequence Diagram Bid. Bina Teknis The proposed

4. Sequence Diagram Bid. Bina Marga



Picture 9. Sequence Diagram Bid. Bina Marga The proposed

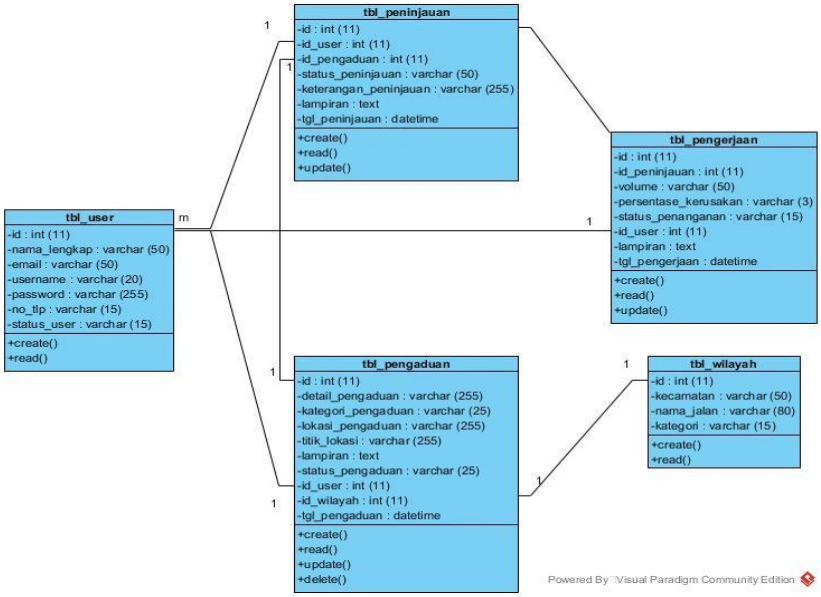
5. Sequence Diagram Head of Department



Picture 10. Sequence Diagram Head of Department The proposed

3.5. Class Diagram

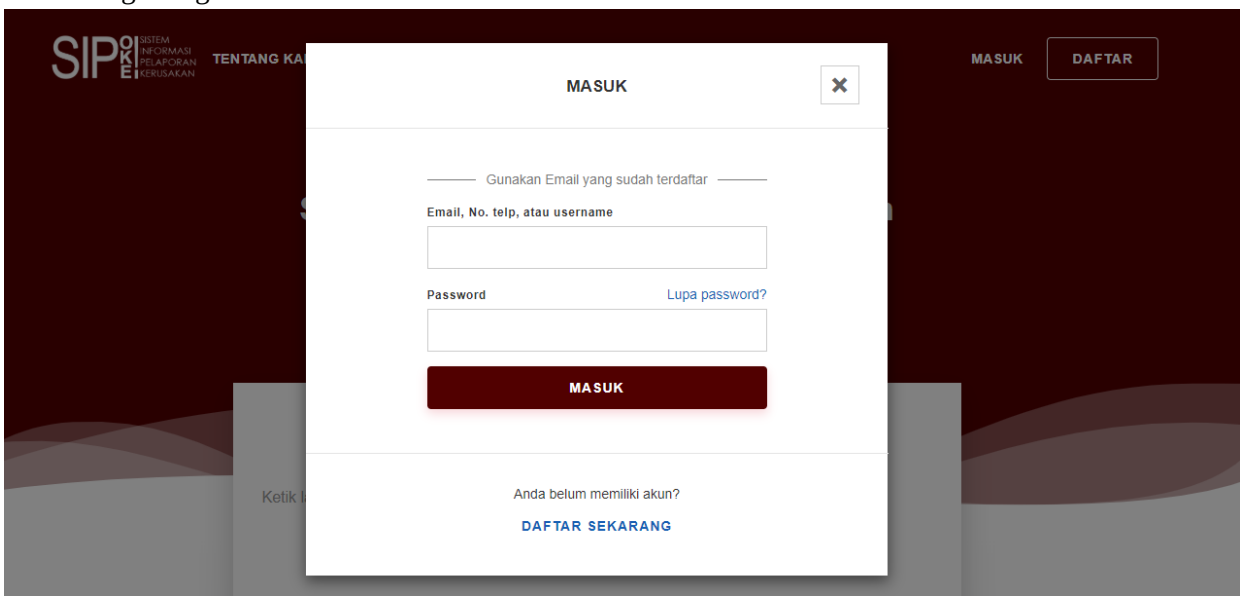
Class diagrams are diagrams that always exist in object-oriented system modeling. The class diagram shows the relationships between the classes in the system being built, and how they work together to achieve goals.



Picture 11. Class Diagram

3.6. Program Design

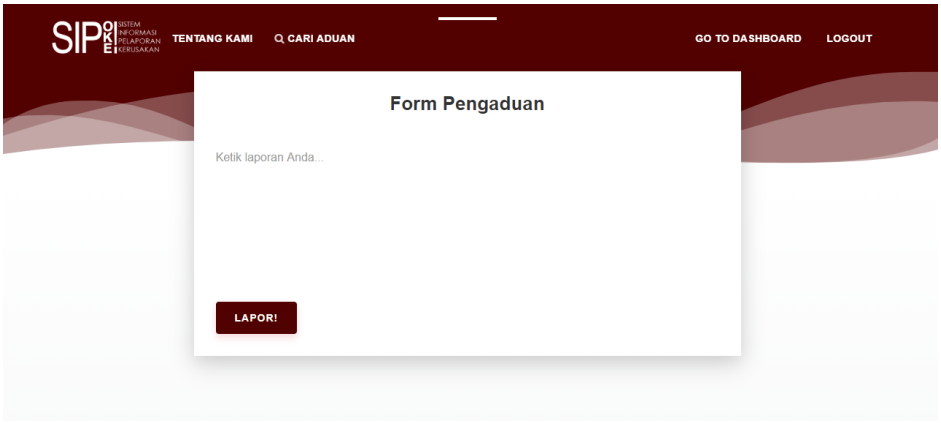
1. Login Page Views



Picture 12. Layout Login

The above display is the initial display before entering the system page. Each user must enter the correct user name and password to log in to enter the system.

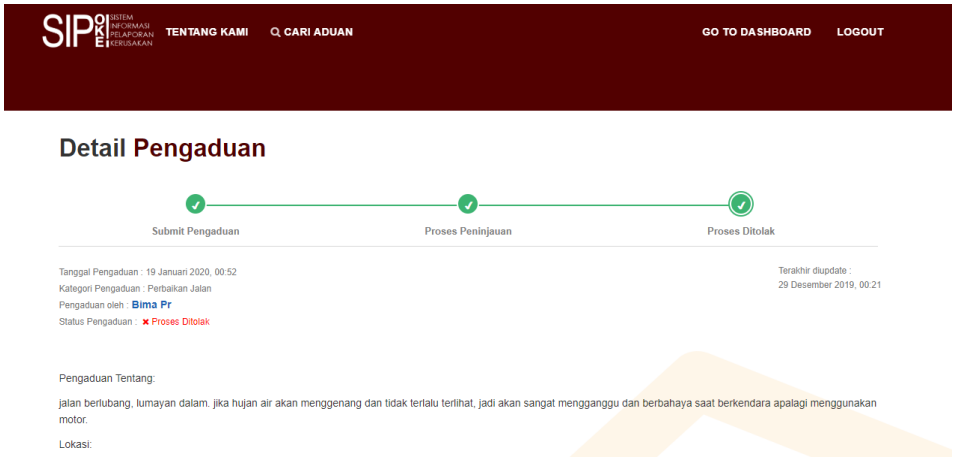
2. Complaint Form Display



Picture 13. Complaint Form Layout

The display above is a display of the Complaint Form page which presents a page in which there is a type, area, detailed address of the damage. On this page, users can add data, edit data, and delete data.

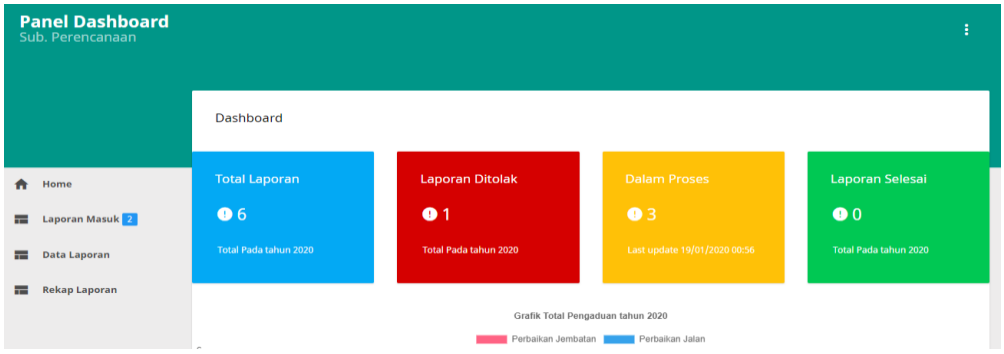
3. Display of Community Report Status



Picture 14. Community Report Layout

The display above is a display of the Report Status page which is available to community users.

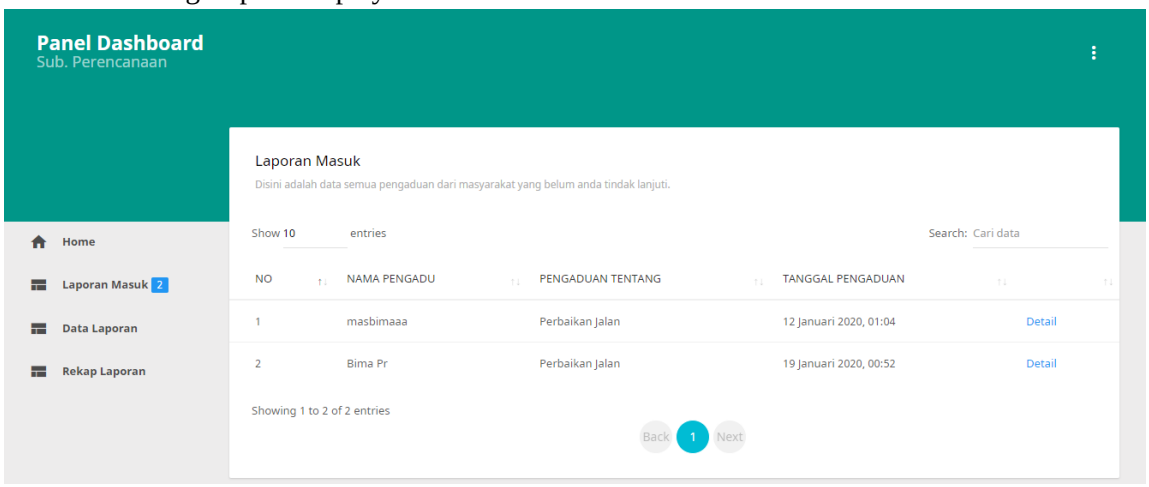
4. Sub Dashboard view. Planning Section



Picture 15. Sub Dashboard Layout. Planning Section

The display above is the main display or Dashboar Sub. Planning section, the display above will appear if the user has entered the correct username and password.

5. Incoming Report Display



Picture 16. Layout Laporan Masuk

The display above is a display of the Complaint Form page where on this page there are incoming report data, and a report recap that will be carried out by the Sub. Planning Section.

4. CONCLUSION

Based on the results of observations that have been made and based on the description in the previous chapter. Then you can draw the following conclusions:

1. Constraints in the current road and bridge damage reporting system have not made it easier for the public as a reporter to file a damage report. This is because the reporting process is still running manually and has not been properly monitored by the sub-agencies due to the accumulation of reports that have not been recorded which makes it vulnerable to losing damage reports that have been submitted and it still takes quite a long time to get confirmation.
2. The Damage Reporting System for Roads and Bridges at the UPT Dinas Bina Marga and Water Resources Tangerang Regency has not produced accurate information because the data generated often do not match what has been reported. For example, report confirmation is forwarded or rejected due to messy data processing which allows frequent human errors, therefore a well-computerized system is needed, so that the sub-agencies and the reporters get accurate information.
3. In designing the Reporting Information System, the author uses the Unified Modeling Language object orientation which consists of several system activities that run up to the proposed system which is described by UML (Unified Modeling Language), using the PHP programming language that can display menus such as login, dashboard , input budget, approve report, and final report, and use MySQL database.

5. SUGGESTED

1. The need for training that must be provided to the parties concerned in order to use this application properly.
2. It takes a server that has a large capacity to improve the performance of the system that is created and requires an auto backup system to maintain data from the system that has been created.
3. The existence of socialization of the proposed system and what has been made to staff or ranks in the organization as the user of the system.

6. REFERENCES

[1] Basaria Ifoh (2016), "Perancangan Sistem Informasi Perencanaan Pembangunan Jalan Dan Jembatan Pada Dinas Binamarga Dan Sumber Daya Air Kota Tangerang" diterbitkan oleh Widuri Raharja. Skripsi.

[2] Aris, A., Firdaus, T. P., & Nurseha, N. Aplikasi Program Quality Control Barang Untuk Menunjang Pelaporan Pada Bagian Teknik Perguruan Tinggi Raharja. Journal Cerita, 4(2), 159-168.

[3] Maulani, Giandari, Kartika Buana Sejatidan Zahrotul Hayati. 2016. Sistem Informasi Pengelolaan Data Laporan Hasil Produksi Berbasis Website Pada PT Nikona Graha Tangerang. Jurnal Informatika Vol. 2 No. 1 Ferbuari 2016. STMIK RAHARJA

[4] Maulidiansyah, R., Rakhman, D. F., & Ramdhani, M. A. (2017). Aplikasi Pelaporan Kerusakan Jalan Tol Menggunakan Layanan Web Service Berbasis Android. JURNAL ISTEK, 10(1).

[5] Dewi, C., & Sasongko, A. W. (2018). Sistem Pelaporan Infrastruktur Dinas Bina Marga Dan PSDA Kota Salatiga Menggunakan NodeJs Berbasis Web. Indonesian Journal of Computing and Modeling, 1(1), 10-17.

[6] Sihombing, D. O. (2016). Perancangan Sistem Informasi Pelaporan Masyarakat Untuk Kerusakan Jalan Di Pontianak Menggunakan Google Maps Api. Jurnal Khatulistiwa Informatika, 4(1).

[7] Kim, Y., Jung, H., Kim, S., & Park, C. (2018). Emergency and Permanent Repair Technology for Damaged Road Bases and Slopes using Gravel-Netting Concrete. International Journal of Highway Engineering, 20(2), 9-17.