

Design and build online citizens complaint system in Labuhanbatu using Waterfall Method

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Abstract: The rapid development of ICT has opened up opportunities for citizens to submit opinions and complaints to the Government, which facilities are guaranteed by law. The provision of these facilities is in the form of implementing e-Government. The government must provide an application that is Government to Citizens/Consumers (G2C) which aims to bring the government closer to the community interactively through access channels that can be reached by the community. Labuhanbatu is a district located in North Sumatra Province with a population of 493,899 people. However, until now there is no facility for the public to submit aspirations or complaints based on e-Government applications. This study aims to create a web-based online application for aspiration and complaint services for the people of Labuhanbatu Regency. This application is called LAPO, which stands for Online Aspirations and Complaints Service. The method used in this research is the Waterfall model. This research has succeeded in creating a web-based online aspiration and complaint service system for Labuhanbatu residents that shows the compatibility between the expected results and the actual results. The results of the study have proven that to design and build this system, the following stages are carried out: analyzing system requirements, system design, implementing the system, and conducting system testing. With this research, it is hoped that it can become one of the e-Government applications for aspiration and complaint services that can be used by the Labuhanbatu Regency Government easily and with low infrastructure costs by utilizing existing human resources.

Keywords: Citizens; Complaint System; e-Government; G2C; Labuhanbatu; Web.

INTRODUCTION

The very rapid and comprehensive development of Information and Communication Technology (ICT) into people's lives opens up new opportunities and challenges to create, access, manage, and utilize information appropriately and accurately (Aminudin & Putra, 2014). The development of ICT has also had a major impact on the government sector which is trying to adopt technology to increase efficiency and transparency (Sintiya, Susanto, & Puspitaningrum, 2020). ICT is currently being applied more as a stimulus than as a facilitator that the government can use to improve the functions of transparency, responsibility and public services in reducing bureaucratic processes in government (Turnip, Lubis, Sutrisno, & Lubis, 2018). The application of ICT can be utilized in the field of government, one of the applications is E-government. E-government basically consists of the use of electronic communication technologies such as the internet, in improving and advancing public access to public services (Thierry & Priyambodo, 2017). The purpose of implementing E-government is so that the government can provide services to all levels of society for the data access points they need (Arief, Sensuse, Latif, & Abbas, 2021). In Presidential Instruction No. 3 of 2003 concerning e-government development policies and strategies, the government must be able to utilize ICT to improve government efficiency, effectiveness, transparency and accountability (Napitupulu, 2016). One type of e-government service that can be applied is an interaction service that allows the government to carry out two-way communication to the public regarding complaints or consultations (Oetomo, 2016).

Today's society is a society that is very dependent on the consumption of information so that all its activities cannot be separated from the use of information media based on digital technology (web and social media)

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(Fadilla, 2020). The most widely used digital device by the Indonesian population in 2020 is mobile phones with a percentage of 96% consisting of 18 to 34 years of age (Rosyadi, Amrullah, Marcus, & Affandi, 2020). The number of Indonesians who have access to the internet is very high at this time, there are 204.7 million people who can access the internet in early 2022 (We Are Social (KEPIOS), 2022). According to a survey conducted by the Association of Indonesian Internet Service Providers (APJII) regarding reasons for using the internet, it was found that the reason for using the internet for social media purposes was in position 2 with a percentage of 11.5%, while the first position was due to reasons for communication via messages with percentage of 24.7% (Agustyani & Santoso, 2019).

Labuhanbatu is a district located in North Sumatra Province with a population of 493,899 people (B. P. S. K. Labuhanbatu, 2021). However, until now there is no application or website that provides facilities for the public to make complaints on the official website of the district government (P. Labuhanbatu, 2021). This study aims to create a web-based online complaint and aspiration service system for the people of Labuhanbatu Regency. The formulation of the problem in this research is how to design and build a web-based online aspiration and complaint service system for the Labuhanbatu community using the waterfall method. With this research, it is expected to be one of the e-government applications for aspiration and complaint services that can be used by the Labuhanbatu Regency Government easily and with low infrastructure costs by utilizing existing human resources.

LITERATURE REVIEW

Complaint management is a process and procedure by which a company or government systematically receives, investigates, resolutions, and prevents and recovers complaints from problems experienced by customers/citizens (Kumar & Kaur, 2020). Public complaints are a form of participation in the context of public service delivery, where such participation can be in the form of complaints regarding service quality (Iqbal & Virginia, 2020). An indicator of the success of participatory governance is the involvement of the community in administering government and public services which is realized through complaints (Ju, Liu, & Feng, 2019). Government in Law no. 25 of 2009 has an obligation to receive and manage public complaints (R. Indonesia, 2009). In dealing with public complaints, the government must innovate the system by utilizing Information and Communication Technology (Somantri & Hasta, 2017). Article 33 of the Presidential Regulation of the Republic of Indonesia Number 95 of 2018 states that every Central and Regional central agency must use a government Service Liaison System to facilitate integration between Electronic-Based Government System Services (SPBE)/e-Government (P. R. Indonesia, 2018).

E-Government is the application of ICT by the government in providing services to the community which aims to improve the efficiency, effectiveness, and transparency of government performance in order to make it easier for the public to obtain information related to government work (Arief & Abbas, 2021). In addition, the purpose of ICT is for citizens to use a single data access point for government services by integrating Government Organizations (G2G), Government to Society (G2C), Government to Business (G2B), and Government to Employees (G2E) (Arief et al. al., 2021). In Presidential Instruction Number 3 of 2003 concerning National Policies and Strategies for the Development of e-Government (P. R. Indonesia, 2003) it is stated that there are 4 levels in the development of e-Government, namely, the stages of Preparation, Maturation, Stabilization, and Utilization (Napitupulu, Pamungkas, Sudarsono, Lestari, & Bani, 2020). At the 4th level in the development of e-Government, namely the Utilization Level, the Government must provide an application that is Government to Citizens/Consumers (G2C) which aims to bring the government closer to the community interactively through access channels that can be reached by the community.

METHOD

This study applies the System Development Life Cycle with the Waterfall method as a method in developing software because it is easy to implement with a sequential approach (Indriani, Dar, & Irmayanti, 2022). The stages are carried out using the waterfall method as shown in Figure 1 starting from requirements analysis, system design, implementation, and testing (Utami, Zen, & Rauna, 2021).

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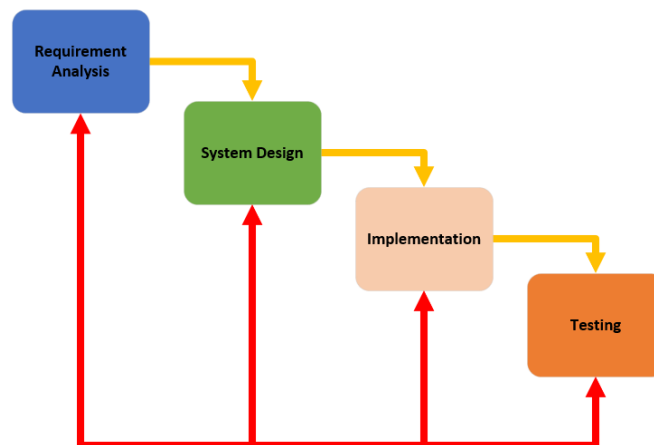


Fig 1. Waterfall Method

Requirement Analysis

The online public complaint system in Labuhanbatu Regency is realized in a web-based application called LAPO which stands for Online Aspiration and Complaints Service. Based on the interviews that have been conducted, the functional requirements of the system are obtained which can be explained as follows:

- Citizens should be able to access their accounts at any time
- The application runs on a web-based device
- Admin follows up on community reports to authorized officers according to the type of complaint
- Officers or Staff can view community complaints reports through the application
- Citizens can see the report whether it is followed up or not

System Design

In this phase, system design is carried out which includes system design by applying Use Case Diagrams and system database design by applying Class Diagrams. Use case design is a business process obtained through interviews in the field based on system functionality (Rahmawati, 2020). The use case design proposed in this study is shown in Figure 2.

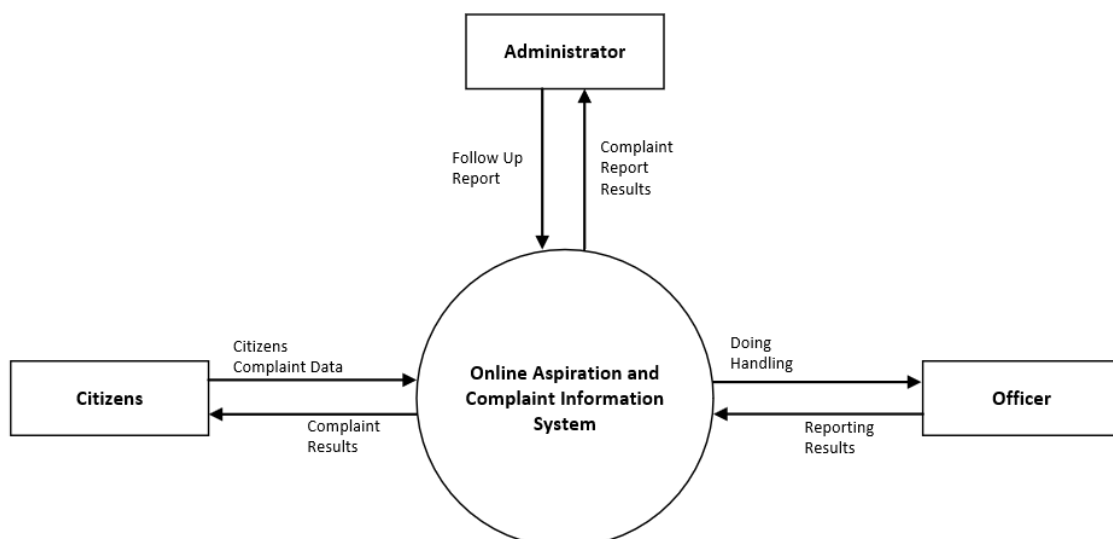


Fig 2. Context Diagram

From the context diagram in Figure 2, it can be seen the relationship described by the entity, namely Administrator, Officer and Community.

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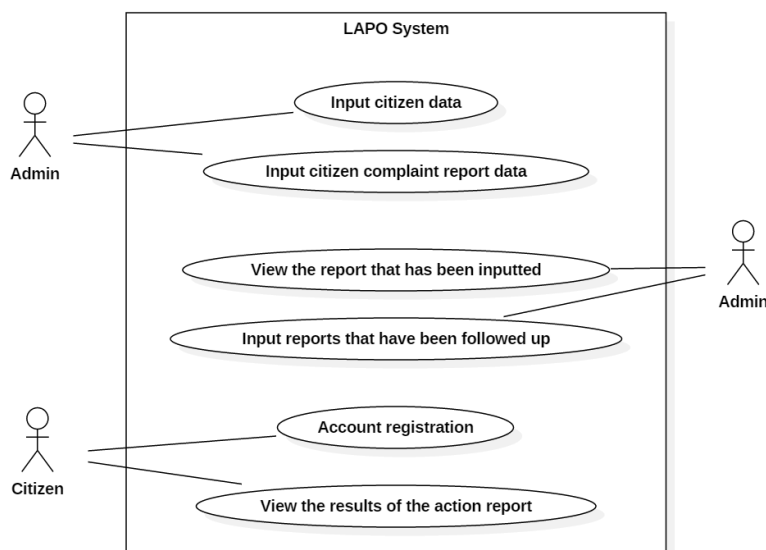


Fig 3. Use Case Diagram

Based on Figure 3, there are three actors in the LAPO system. The first actor, namely Admin, is tasked with confirming community reports and following up on the officers according to the types of complaints. The second actor, namely the Officer, functions to follow up on reports to handle complaints and report the results of the follow-up work on reports. While the third actor, namely the community, can complain about their aspirations and their villages through the LAPO system, and then can also see the results of the follow-up to complaints.

The second diagram, namely the class diagram, provides an overview of the data structure in explaining the relationship between each entity in the database based on data objects that are related to each other (Utami et al., 2021). The class diagram on the Lapo system is shown in Figure 3 below.

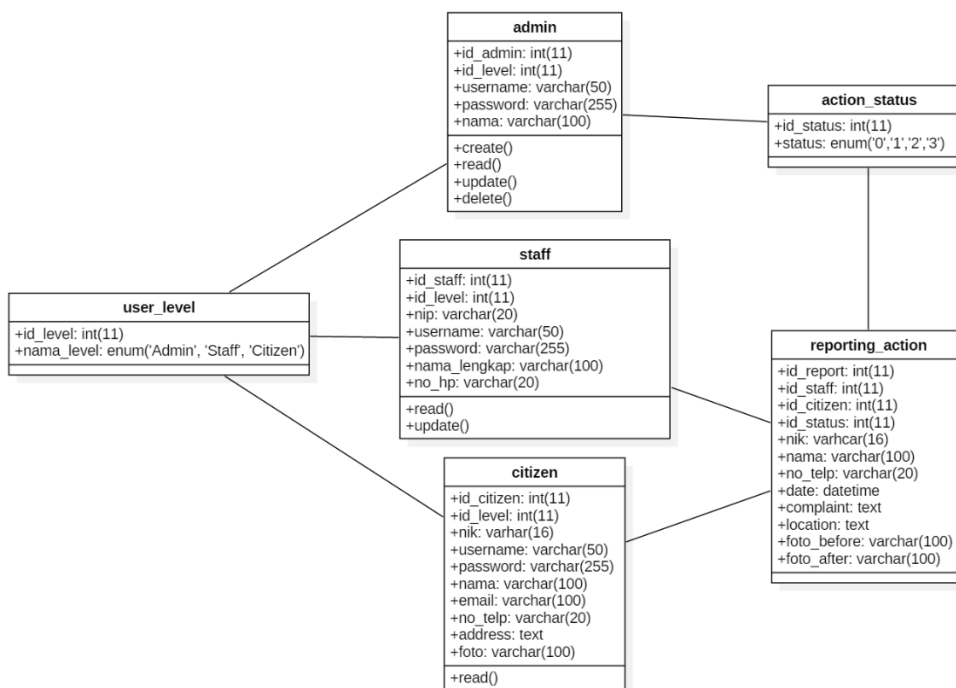


Fig 3. Class Diagram

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Implementation

This section describes the software used in implementing the LAPO system. The Class Diagram is then implemented in the form of creating a database using the MySQL Database Management System (DBMS). Making program code using the PHP programming language based on the Codeigniter framework. The CodeIgniter framework is very suitable to be applied to small and medium-scale web-based applications because this framework is lightweight and flexible in web development.

Testing

This stage is part of testing the system after it is implemented. Testing the system using the blackbox method. The trials carried out focused on the functional aspects of the system based on the user's point of view. System testing does not focus on program source code.

RESULT

This research has produced an application product for the online community complaint system in Labuhanbatu Regency called LAPO. The operational process of the LAPO application is in accordance with the previously designed design. In the LAPO application, there are three different types of account level categories according to their respective access rights, namely: Admin, Staff, and Citizen. The admin has full access to the management of the accounts in the system. The officer functions to follow up on what is assigned by the admin in terms of handling public complaints reports, as well as reporting on the progress of what has been done. Meanwhile, community members can only submit complaints and see the follow-up results of the complaint. In this LAPO system, there are four types of status reports, namely, reports received, reports processed, reports completed, and reports rejected which are implemented through the assignment ticket system. With this ticket system, citizens can see the progress of their complaint report along with the status of the complaint.

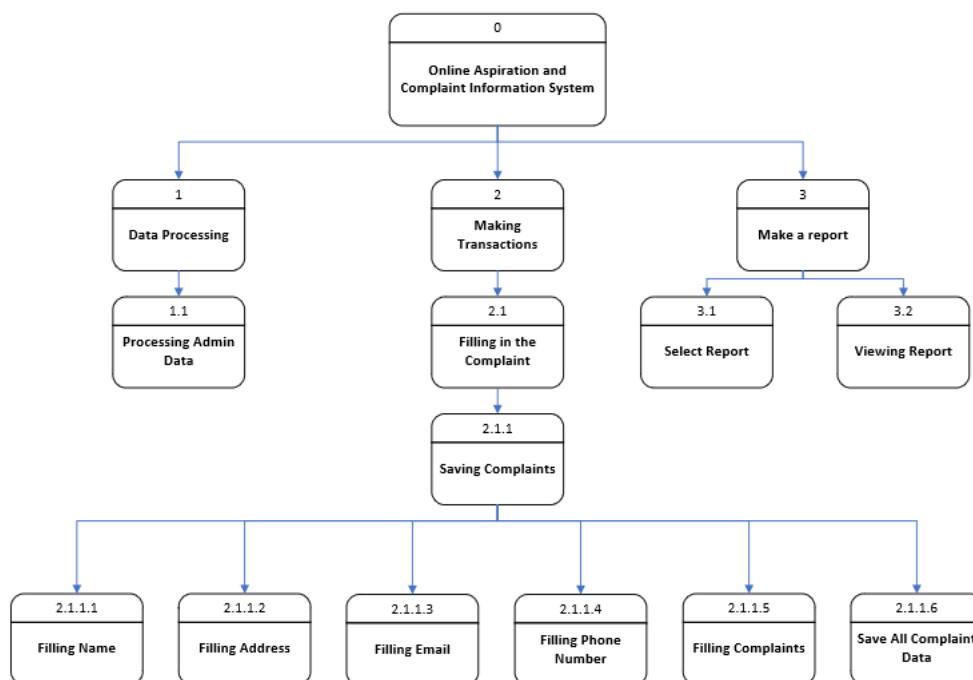


Fig 4. Citizens Complaint Hierarchy Diagram

To file a complaint against a public facility, the public can login to the LAPO system after registering. To view complaints reports from the public, Admin and Officers must also register to get an account. Figure 4 shows the login page of the LAPO application, where Admin, Officers, and Community Members can login.

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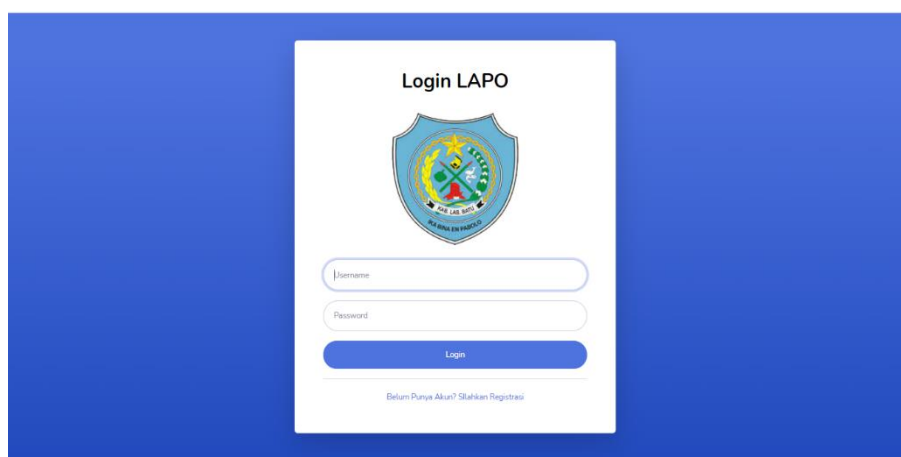


Fig 5. Login Page

After the Admin has successfully logged in to the LAPO application, a dashboard from the admin will be shown showing the number of existing officers, the number of complaint reports, the number of complaint reports being processed, and the number of completed complaints. The admin dashboard serves to make it easier for Admins to manage notifications. In addition, Admin can also recapitulate reports through the Generate Report menu on the left menu of the system. The Staff also has a dashboard that contains information about complaint tickets. There is information regarding all incoming complaints, processed complaints, and completed complaints. After the community members log in, a complaint form has been provided to make a complaint report to the government. In the complaint form, there is a report content form to explain in a narrative what you want to report. Citizens can also upload photos of the reported subject. Also on this menu, residents can see the status of the complaint, whether it is being processed, has been completed, or the complaint is rejected.

These are complaints from members of the public that must be responded to by the admin, whether the complaint is approved or rejected. In detail, the incoming complaint reports show the date of the complaint, the status, and a description of what was reported by members of the public. In addition to responding with a choice of “Agree” or “Deny”, admins can also provide a narrative response in the Response column. When the complaint report has been approved by the Admin, the report will automatically be sent to the officer page. Furthermore, the officer will follow up on the report to execute what the community members report. After the work process is completed, the officer must update the work by pressing the "Finish" button. The Generate Report page of all complaint reports which can only be accessed by the Admin. On this page you can preview or download the reports that have been submitted.

Table 1 shows the purpose of the test scenario stages for the LAPO application using the Blackbox Testing method. Tests were carried out on the functionality of the buttons on the LAPO application menu.

Table 1. Blackbox Testing Result

Scenario	Expected Results	Result
Click Login Button	The system directs to the the dashboard menu	Success
Click menu Pengaduan	The system displays a menu Pengaduan	Success
Click Submit Pengaduan Button	System displays all complaints	Success
Click Submit Setuju Pengaduan Button	The system displays the complaint is being processed	Success
Click Selesai Pengaduan Button	The system displays the completed complaint	Success
Click Logout Button	The system displays the login form	Success

The test results in Table 1. show the correspondence between the expected results and the actual results. So it can be concluded that the testing process on this system using the blackbox testing method has been successful.

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DISCUSSIONS

This research which has resulted in the application of Online Aspirations and Complaints Service (LAPO) is an effort to contribute to the implementation of e-Government in Labuhanbatu Regency. Although the Government of Indonesia has provided a similar application, namely LAPOR!, the socialization and application of this application is also minimally used in Labuhanbatu. LAPO is the author's initiative in presenting an application-based e-Government model that can be accessed by residents of the Labuhanbatu area. When compared to the LAPOR! which tends to be centralized (centralized), the LAPO application is present as a creative capital for regional decentralization in implementing e-Government in the context of complaints against public facilities and services.

The LAPO application was built by implementing the Waterfall method which includes 4 development phases, namely, starting with an analysis of system requirements concerning the functional and non-functional aspects of the system, then system design, after that implementing the system and testing the system with the blackbox testing method.

The LAPO application is still being developed on a web-based platform. In the future, it is necessary to innovate so that this application can be run on smartphone-based devices such as Android and iOS. In addition, it can also be further developed by integrating this application into message-based applications (WhatsApp, Telegram, etc.) by adding a reminder feature regarding the status of reports that have been sent.

CONCLUSION

Based on the results and discussions that have been described previously, it can be concluded that LAPO is an application that can be used as a medium for public complaints about public services and facilities in Labuhanbatu Regency. The Blackbox Testing method has also successfully tested the functionality of the buttons on the menus in this LAPO application. The results of the study concluded that to design and build this system, the following stages were carried out: analyzing system requirements, designing systems, implementing systems, and conducting system testing.

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