Implementation of the E-Letter Service System Application Information based on Android

Muhammad Rizaldy Nur Cahya
Dept. of Informatic Engineering
University of Technology Yogyakarta
Jl. Siliwangi, Jombor Lor, Kec. Mlati, Kab. Sleman, Daerah Istimewa Yogyakarta 55285

Arief Hermawan
Dept. of Informatic Engineering
University of Technology Yogyakarta
Jl. Siliwangi, Jombor Lor, Kec. Mlati, Kab. Sleman, Daerah Istimewa Yogyakarta 55285

ABSTRACT
Population administration services are crucial for measuring community satisfaction with services received as well as for enhancing the quality of an institution. The dearth of village population service applications that can help the community manage the necessary correspondence serves as the backdrop for this study. The fact that so many correspondence service procedures are still done by hand reduces the efficiency of the system. Population administration services, which were formerly performed manually but can now be completed online without having to visit the village office in person, must advance along with the all-digital era. In order to solve this issue, an Android-based community contribution e-letter application system was designed. Interviews and observations are used to gather data. Use cases, activities, and data flow diagrams are the components of the system that UML (Unified Modeling Language) modeling creates. Android apps that try to make it simpler for people to handle the necessary correspondence are the study's output.

General Terms
Android Application

Keywords
Public service, Firebase, Service system, Unified Modeling Language, Population administration, Application Information.

1. INTRODUCTION
Government agencies need an information system that meets their needs in increasing work efficiency and effectiveness as well as in providing services to the community since technological advancements happen so quickly and they must keep up with them. It will be simpler and more effective with a public service information system. The pertinent community data can be managed by the government.

Village of Plosokerep The Plosokerep Subdistrict is a government organization that manages requests for birth certificates, family cards, certificates of incapacity, and regional move certificates. However, all of this data is still processed by hand. In the initial procedure, participants come straight to the Plosokerep Village office with the required documentation. Sub-district staff will fill out the necessary paperwork after the requirements are finished, which might slow down the service process and increase the chance of written errors.

Because population data is still recorded manually, it can be challenging to locate information when it is needed because it is still kept in books. As a result, stored archives fill up, and it becomes challenging to locate information on births, deaths, new residents, and residents who have moved. In order to create a recapitulation report and enhance community services, population data has to be re-entered in Microsoft Word at the conclusion of each month. People will find it easier to access and obtain information with this application.

Based on the aforementioned issues, the issues that arise can be identified, specifically the slow document production caused by the absence of public service facilities to spread information about services for creating population documents like birth certificates, KK (family card), and KTP (resident identification card). processing letter for resident biodata. As a result, we want a population data processing Android application that makes use of computer technology and can deliver data precisely and swiftly.

The author intends to develop an Android application called E-Letter Service System Application Information Based on Android that provides information about community services and is based on current issues.

2. RESEARCH METHODS
This section provides a detailed account of every stage of the study experiment, which includes the following:

2.1 Research Stages
2.1.1 Observation
In order to gather data for future studies, direct observations of the Plosokerep District Office's current practices and processes were made.

2.1.2 Device analysis
Conducted before developing an application program in order to gather information, models, and specifications about the hardware and software that will be utilized.

2.1.3 Data collection
The source of the data gathering has been identified and is derived from prior obligations. A requirement is a list of both needs and application requirements. The requirements will guide the planning and structuring of the application creation process. Furthermore, requirements can support time testing after the program has been finished.

2.1.4 System planning
Researchers designed the system application that was going to be made before it was really made. With no elements left out, this design attempts to make it simpler for researchers to develop and execute the system or application they wish to.

2.1.5 System testing
The completed system will undergo testing in accordance with

the predetermined needs. Nothing is left undone or does not satisfy your wants; all requirements must be fulfilled.

2.2 Data Obtained

The initial set of data comprises the specifications needed to process an electronic letter. Each electronic letter has distinct specifications. Using an example will help: What prerequisites must be met in order to process the e-letter business? To process the letter of business information, three prerequisites must be met. First, the RT or RW's cover letter. And a duplicate of the family card, too. Cards for population identification come in third. The sheet that is attached has further original data.

2.3 Data Collection Procedures

2.3.1 How to collect data

The procedure for gathering data is as follows:

2.3.1.1 Observation

Actions taken to grasp other knowledge and acquire information in the form of data. The observation method I used was non-participant observation, as the observer only watched from a distance and did not actively take part in the activity's observation portion. This is the extent to which the facts I have gathered may be fully united, as seen.

.2.3.1.2 Interview

This interviewing technique is used in a step-by-step manner to gather pertinent facts and information on different sorts. What services does the sub-district office offer? One of the twelve staff members who work at the sub-district office in the section serviced was interviewed for the interview.

2.3.2 Data source

Primary data collected directly from the Plosokerep Village Office served as the research's data source. Information Interviews and interview observation were used to gather information for this primer.

2.3.3 Location of data collection

In Blitar City, East Java, at the Village Office Plosokerep, data was collected.

2.3.4 Data collection time range

Data collection is implemented over the course of one month, from May 1, 2023, to May 31, 2023.

2.4 Analysis Systems

2.4.1 Running system analysis

The Plosokerep Subdistrict Office still uses a manual service system. Visitors arrive at the subdistrict office during the hours that the service is open. Depending on when they are arriving, people must line up ahead of time. Society must first bring the paperwork required to handle the letter information. usually calls for an RT/RW local cover letter. The documents, which included an RT/RW cover letter, resident identity card, deed, birth certificate, and family cards, were requested to be submitted by the community when they were contacted to handle the letter information. The next step is for society to wait for the letter-making process to be completed.

2.4.2 Analysis of the proposed system.

The Plosokerep District Office will use an online service model for its proposed service system. It is not necessary for people to visit the sub-district office. Simply sign in to the application and choose the required letter. The necessary files are already included in the application. Users only upload files from their smartphone gallery or camera. People then have to wait for the letters to be processed.

2.4.2.1 Functional analysis

An analysis of functional needs is a sort of requirement that includes details on the procedures that the system will eventually carry out. It is also specified in functional requirements what data must be provided and generated by the system. Three items may be used to define functional requirements: the procedures that must be followed, the expected results, and the necessity for certain input types.

Table 1. Input Requirements of System

No	Users	Input Requirements
1.	Admin	Administrators can alter publicly accessible system data.
2.	User	Users who have downloaded the program can access it through the Google Play store or the website.
3.	Operational agency	Update the Play Store with the newest features so that users may receive system upgrades, and make sure the application is up-to-date by doing the necessary maintenance.

Table 2. Process Needs of System

No	Users	Process Needs
1.	Admin	The administrator gives the software space to process data, and the user provides data to the administrator, which is processed into a letter and returned to the user.
2.	User	Make room for uploading pictures of the criteria for writing letters, and users satisfy the conditions for writing letters by completing the offered web form.
3.	Operational agency	Completing the application customization and software application processes.

Table 3. External Needs of System

No	Users	External Needs
1.	Admin	Able to view incoming messages about requests for help composing letters and Able to transmit finalized files via mail
2.	User	Users are able to download the produced files.
3.	Operational agency	Able to observe the outcomes of population management services.

2.4.2.2 Non-functional analysis

Analysis of the supporting needs for the system to be constructed, such as the software and hardware requirements needed to create this application, is known as non-functional requirements analysis. The following software specifications are utilized in the development of public service apps: Figma is used for web editing and UI design; StarUML is used to construct use case diagrams such as activity diagrams and flow diagrams; Android Studio is used to build and develop Android-based applications; and Firebase is used as a management database. and the web browser Google Chrome. The following hardware requirements are followed while developing public service applications: 15.6-inch Full HD IPS 144Hz display, Nvidia GeForce GTX 1650Ti 4GB, SSD 512GB, Intel Core i5-10300H CPU (8GB DDR 418).

2.5 System Design

2.5.1 Data Flow Diagram

Two external entities are involved in DFD level 0, which are the community as system users and staff as system managers. A number of data streams are available to users, including registration information, login information, RT/RW introduction, family cards, birth certificates, identification cards, land certificates, the most recent SPPT, the newest diploma, passport photos, parents' marriage book, and police loss reports. The administrator will approve requirement files that are uploaded to the system. The administrator will process the user's requested information and provide an output in the form of a letter. Admin is writing a letter.

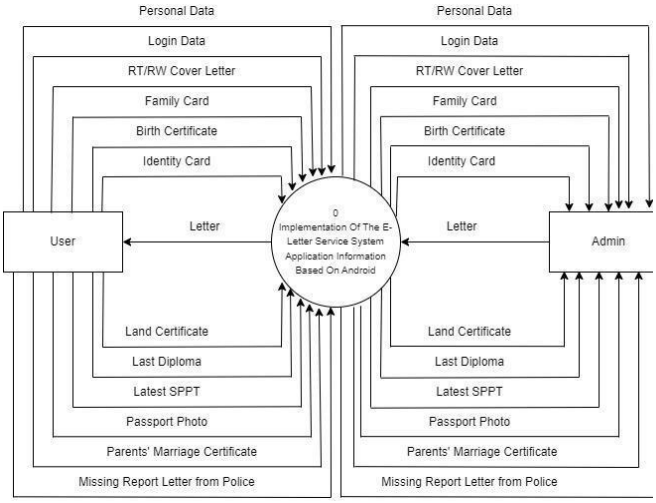

Fig 1: Data Flow Diagram

2.5.2 Activity diagram

Activity diagrams are a type of diagram that may be used to simulate system operations.An example of a use case diagram for an Android-based e-letter service application system may be seen below.

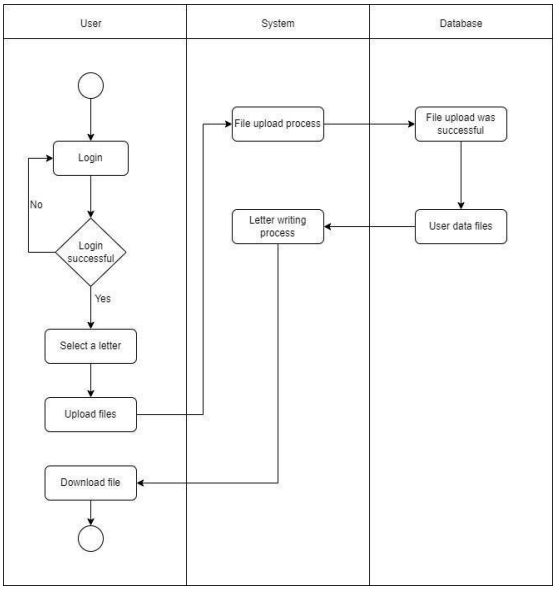

Fig 2: Activity Diagram

2.5.3 Use case diagram

Use case diagrams are among the several kinds of UML diagrams that show how actors and systems interact. An example of a use case diagram for an Android-based e-letter service application system may be seen below.

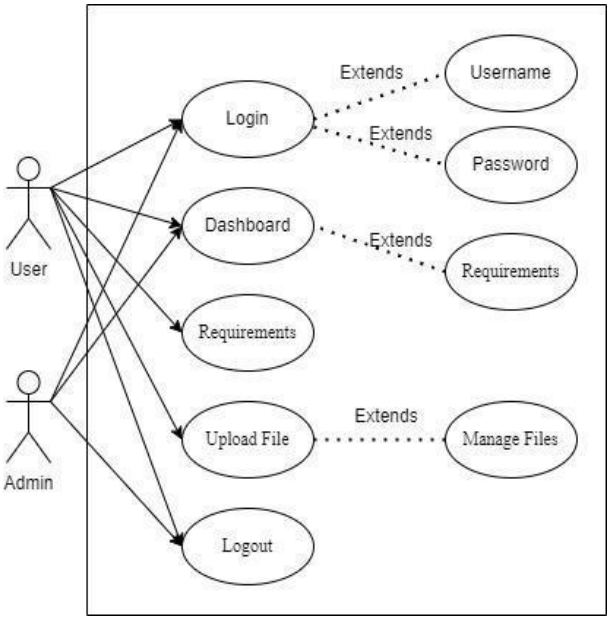

Fig 3: Use Case Diagram

3. RESULTS AND DISCUSSION

3.1 Results

The end product of this study is an Android-based E-letter service application system that the general public and village office staff may utilize. This application was created using Android Studio, Java programming, and Firebase as a database to aid with system administration. There are two systems in this application: an admin system and a user system. The following is an explanation of the application system:

3.1.1 User application page view

Fig 4: User Login Page

The page that the user will see initially is the login page. Users must use the password and email address that they have registered in the database to log in.

Fig 5: User Registration Page

The purpose of the registration page is to establish a new account. Individual user registration is available, and it will be utilized to access the e-letter service application later on.

Fig 6: User Dashboard Page

The dashboard is the page that shows up as soon as the user signs in successfully. Email service menu choices are available on the dashboard page. Subsequently, the user will select a menu item based on their requirements. A function to log out is located at the bottom of this page.

Fig 7: User Requirements Page

The prerequisites page will be displayed to the user once they have chosen a menu item on the dashboard page. The prerequisites for receiving a letter that meets community needs are listed on this page.

Fig 8: User Upload Page

The user will be sent to the upload page after choosing a menu item on the prerequisites page. The user is requested to upload the necessary files on this page.

3.1.2 Admin application page view

Fig 9: Admin Login Page

The page that the user will see initially is the login page. Using the email address and password that have been recorded in the database, administrators must log in.

Fig 10: Admin Registration Page

The purpose of the registration page is to establish a new account. Individual user registration is available, and it will be utilized to access the e-letter service application later on.

Fig 11: Admin Dashboard Page

The required files that the user has submitted are visible to the administrator on this page. If someone arrives to handle letters offline, the administrator can add the required files. In addition, the administrator has the ability to edit and remove requirements files that users have provided.

3.1.3 Database

Firebase is the database utilized in this application. This application uses three Firebase functionalities: cloud storage, authentication, and a firestore database.

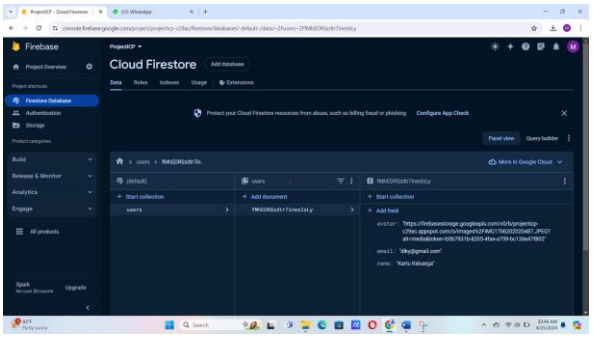

Fig 12: Firestore Database

One aspect of the database is Firestore, which shows all data entered into the system. can take the form of a name, email, or picture link.

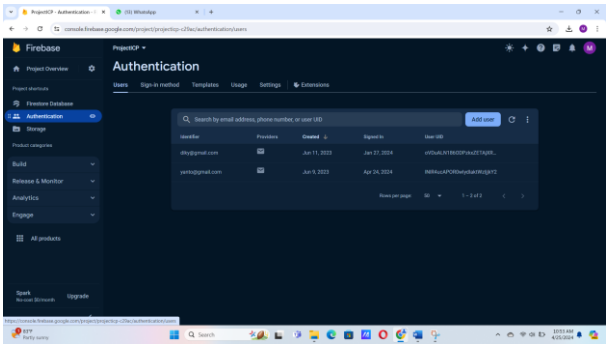

Fig 13: Authentication Database

A database feature called the Authentication Database holds user and admin accounts. In that view, any newly created accounts will be shown. Every account that has the ability to log in will be shown as well.

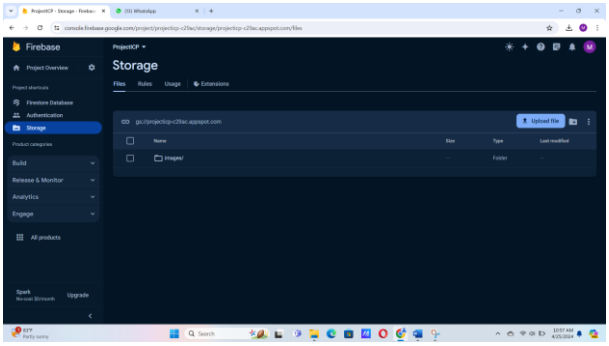

Fig 14: Cloud Storage Database

Real-time picture storage is a characteristic of cloud storage. This page will show every image that has been posted.

3.2 Discussion

This Android-based E-Letter application solution is designed for those who have expressed dissatisfaction with Plosokerep Village's lack of information regarding communication obligations. This application will be very beneficial to the public, as it will inform them of the standards that must be met in order to apply for a letter. Additionally, people may obtain the necessary credentials from home without having to wait in line to fill out papers at the Plosokerep Subdistrict Office.

The primary function of this program is the uploading of photographs, which are then utilized to meet upload requirements. Users can provide data to be kept in a database, such as resident biodata and communication needs, which will then be handled by sub-district authorities. The completed letter will be forwarded to the community that receives it by subdistrict staff. As a finished type of service, the public will obtain the files that are currently available.

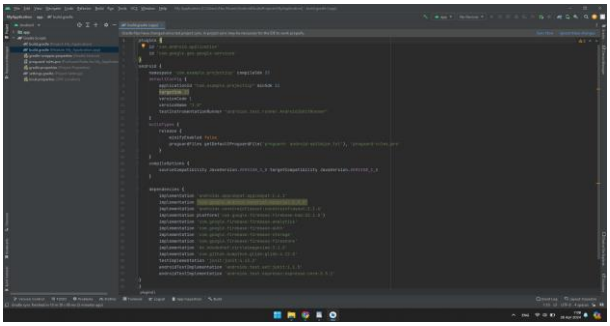

Fig 15: Build Gradle (:app)

The kind of plugin version that was utilized is contained in the build.gradle file, which is a Java script. Additionally, there is a connection to link the software and database in this file.

4. TEST

4.1 Black Box Test

Using the Black Box approach, the E-Letter Information Service System Application was tested. Testing the E-Letter Information Service System Application serves the purpose of determining whether or not the features work as intended.

Table 4. Black Box Test

No.	Features Tested	Expected	Conclusion
1.	Homepage	Enter the application	[√] [ ]
2.	Login Page	Users can see the login page	[√] [ ]
3.	Login Button	Users can go to dashboard	[√] [ ]
4.	Registration Page	Users can see the registration page	[√] [ ]
5.	Registration Button	Users can register	[√] [ ]
6.	Dashboard	Users can see the dashboard page	[√] [ ]
7.	Menu Dashboard	Users can fo to submenu	[√] [ ]
8.	SubMenu	Users can see the requirements	[√] [ ]
9.	Upload Files	Users can upload files	[√] [ ]
10.	Logout Button	Users can logout	[√] [ ]

4.2 Questionnaire

The questionnaire test was acquired by doing a public demonstration project. The general population will use the program and complete a pre-made survey.

Table 5. Questionnaire

NO.	Question	Answer
1.	Is it straightforward to use this application?	90% strongly agree 10% agree
2.	Does this application have a visually appealing appearance?	80% agree 20% strongly agree
3.	Do the buttons on the app function properly?	60% strongly agree 30% agree 10% netral
4.	Is it possible for you to register?	70% strongly agree 30% agree
5.	Does using a registered account allow you to log in?	60% agree 30% strongly agree 10% netral
6.	Does the "Menu Page" have every function operating as it should?	50% strongly agree 30% netral 20% agree
7.	Are you experiencing issues with picture uploads?	50% disagree 30% strongly disagree 10% netral
8.	Is there a problem with this program that you find confusing?	50% strongly disagree 50% disagree
9.	Is submitting a certificate becoming easier with this application?	50% strongly agree 40% agree 10% netral
10.	Does this application assist you in learning about the criteria for mail processing?	70% strongly agree 20% agree 10% netral

5. CONCLUSION

Based on the findings and discussion surrounding the "implementation of the Android-based e-letter service system application," it can be said that this application was created to make it simple and quick for individuals wishing to handle certificates at the Plosokerep sub-district office to handle correspondence online. It can also give information on what prerequisites must be met in order to process the necessary certificate. Employees of the subdistrict offices may find it easier to complete community service tasks with the help of this application. This program should be helpful in today's digital age, particularly in terms of social interactions. In order to develop stronger and more ideal community service, it is intended that this application will serve as a reference in the future.

6. REFERENCES

[1] Arie, Kimbal Anthon, Olga Engelien Melo, Robby Tangkudung, Harson Kapoh and Roby Lumbu, " Development of 3D Education Game with Pancasila Theme Based On Android," in *International Journal of Computer Applications*, (0975-8887), Volume 186 - No.1,January 2024.

[2] Eldo, Dwian Hartomi Akta Padma, and Dyah Mutiarin, "Analisis Best Practice Inovasi Pelayanan Publik (Studi Pada Inovasi Pelayanan 'Kumis Mbahtedjo' Di Kecamatan Tegalrejo Kota Yogyakarta)," in *Jurnal Manajemen Pelayanan Publik,* 2019, 156, Doi: 10.24198/Jmpp.V1i2.16753.

[3] Kurniawan Ikhsan, Fatimah Fahurian, and Aliy Hafiz, " Rancang Bangun Aplikasi Cloud Storage Dengan Anggular Dan Firebase Berbasis Android," in *Jurnal Management Sistem Informasi dan Teknologi*, 2019, ISSN 2088 - 5555.

[4] Mahdias. Hammer Zoelfagar, Himawat Aryadita. and Satrio Agung Wicaksono, "Pengembangan Aplikasi Layanan Pengaduan Masyarakat Untuk Dinas Kependudukan Dan Pencatatan Sipil Kota Pasuruan Berbasis Android," in *Jurnal Pengembangan Teknologi, Informasi dan Ilmu Komputer*, 2019, 3. 167-176.

[5] Mahsyar, Abdul, "Masalah Pelayanan Publik Di Indonesia Dalam Perspektif Administrasi Publik," in *Jurnal Ilmu Pemerintahan,* 2011, 81–90. Doi: 10.26618/Ojip.V1i2.22.

[6] Nasrizal, Naufal Raid and F. Yasmeardi, "Analisis Kepuasan Masyarakat Terhadap Pelayanan Publik Di Era Covid-19," in *Jurnal Manajemen Sumber Daya Manusia, Administrasi dan Pelayanan Publik.* 2021.

[7] Rosdania, Fahrul Agus and Awang Harsa, "Sistem Informasi Geografi Batas Wilayah Kampus Universitas Mulawarman Menggunakan Maps API," in *Jurnal Informatika Mulawarman,* 2015.

[8] Safitri, Laila, and Sucipto Basuki, "Analisa Dan Perancangan Sistem Informasi Text Chatting Berbasis Android Webview," in *Jurnal IPSIKOM.*

[9] Susandi, Dony, Dede Abdurrahman, Aceng Kusaeri, and HAfidz Sanjaya, "Perancangan Sistem Pelayanan Administrasi Kependudukan Desa Berbasis Web Dengan PHP & POSTGRESQL," in *Jurnal J-Ensitec,*2018.

[10] Zaidiah, Ati, and Gabriel Ryfan, "Rancang Bangun Aplikasi Sistem Pelayanan Masyarakat Berbasis Web Pada Kecamatan Cadasari Kabupaten Pandeglang," in *Seminar Nasional Mahasiswa Bidang Ilmu Komputer dan Aplikasi,* 2020.