



Design of Web-Based Administrative Service Information System with Scrum Method

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Abstract

In the digital era, information systems have an important role in improving the efficiency of public services, including in administrative services. This research aims to develop a web-based administrative service system as a solution to manual systems that tend to be inefficient. The Scrum method was chosen as the development framework because of its flexibility in adapting to user needs as well as supporting collaboration and continuous improvement. The development stage starts from gathering user needs at the Product Backlog stage, followed by Sprint planning, Sprint implementation, to evaluation of work results through Sprint Review and Sprint Retrospective. The results of the development of this system show that the Scrum approach allows the integration of key features that make it easier to manage data and administrative services. The resulting system has succeeded in improving administrative efficiency and providing better accessibility for users. This research also provides insight into the implementation of the Scrum method in the development of web-based information systems, which can be applied to similar projects to improve the overall quality of public services.

1. Introduction

Today's digital era, information systems play an important role in improving the quality of public services. One of them is in administrative services. This research aims to build a website-based administrative service system to replace the current manual process, in order to improve efficiency and accessibility. The manual systems used today lead to inefficiencies in data services and management (Septiara et al., 2024).

Web-based information systems offer a variety of benefits, such as ease of access, such as ease of access, time savers, and increased transparency. The public easily submits applications, checks queue numbers, and gets information on the money needed. This is expected to increase public satisfaction with the waiters provided (Al Hasri & Sudarmilah, 2021).

The rapid development of information technology provides opportunities for government agencies to utilize technology in improving service performance. With the existence of a web-based information system, government agencies can manage data and information more efficiently, and allow the public to access services online (Romadhon & Maryam, 2023).

The method used in this study is Scrum, because it is more flexible and interactive than the Waterfall method which tends to be rigid and less able to respond to changes during development. With the Scrum approach, it is hoped that the system developed can be adjusted more quickly and continue to be improved as needed (Warkim et al., 2020).

Through this research, it is hoped that the website-based information system can improve the ease of managing administration and provide insights related to the use of Scrum in the development of similar systems. With more structured data management, it is hoped that the potential for errors can be minimized, and the decision-making process can be carried out more appropriately to support sustainable public services.

1.1 Literature Review

In previous research, a trial using the Rapid Application Development [RAD] method has been carried out found that the use of this system can provide convenience to employees in Tabam Village in presenting information about village profiles, community data and community complaints. With this system, the public can directly see what data is displayed on the system and the community can also make complaints through this system without having to go to the village office (Kasyif Gufran Umar et al., 2022).

Meanwhile, in other studies, trials have been carried out using the RUP (Rational Unified Proccess) method. Testing of certain functionalities can go well and according to the desired functionality (Fajri, 2021) . And other studies that have been conducted on trials using the waterfall method, the overall feature works well and can provide convenience for obstacles in conventional administrative services or come directly to the village office (Al Hasri & Sudarmilah, 2021).

In previous studies that have been tested using the Importence Performance Analysis (IPA) method. It is known that the level of conformity of the 25 service quality attributes is 91% and there are still 9% of the service quality that has not met expectations (Wisudawati et al., 2023). Other studies that have been tested using the incremental method from the results obtained in the test get better results and can be accepted by system users (Dwi Wahyuni et al., 2021).

The research that has been conducted on a trial basis uses the First In First Out method. It is known that certain functionality tests can run well according to the desired functionality (Fauzi & Rahmi, 2021) . And other studies that have been tested using the System Development Life Cycle (SDLC) methodology. This application can be used as a medium for the application of building villages with information technology and supporting the progress of the village in accordance with the progress of the government in the development of (Syaputra, 2021).

2. Research Methods

The method used in the development of web-based administrative service information systems is the scrum method. The scrum method is an ideal framework for projects with ever-changing needs and require completion in a short period of time. Scrum was chosen because it provides flexibility in development, allows collaboration between teams and users, and supports continuous improvement based on the feedback received. The stages of the Scrum Method are shown in figure 1.

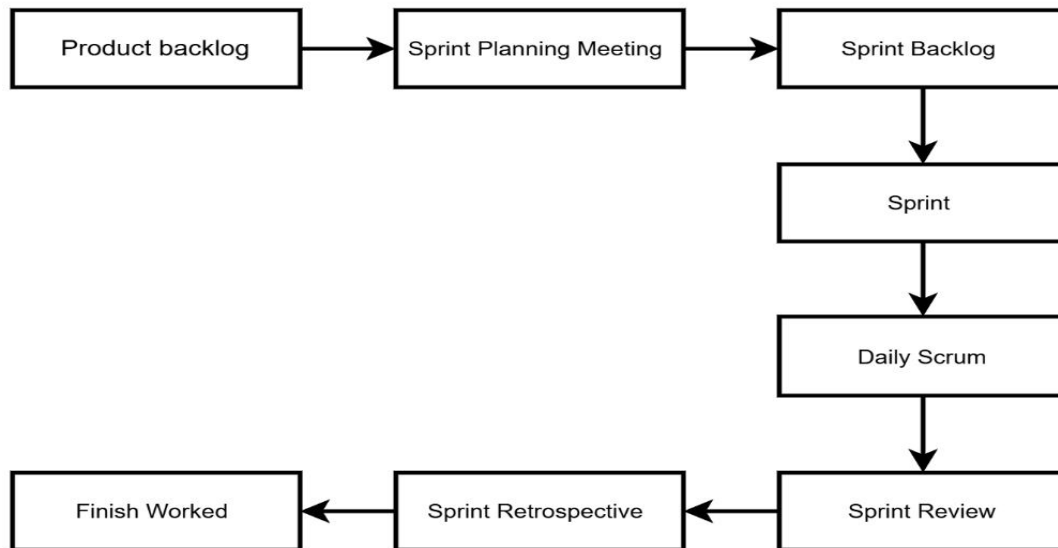


Fig 1. Scrum Method

- **Product Backlog** The scrum stage, which is the collection of all user needs that will be implemented into the system. In its implementation, the product backlog is finalized based on the features needed by users and then sorted based on work priorities.
- **Sprint Planning Meeting** to plan a list of activities to be carried out in accordance with the Product Backlog. At this stage, the team determines which items can be completed in a single Sprint, which is a period of work that typically lasts between 1 to 4 weeks, and moves them into the Sprint Backlog. A Sprint Backlog is a list of items to be worked on during a Sprint, where teams commit to completing all of that work within a predetermined time.
- **Sprint**, the core of Scrum, where teams work on items that are in the Sprint Backlog over a specific period. The work of this Sprint must be ready to be used or tested.
- **Daily Scrum**, That is a short daily meeting that usually lasts 15 minutes. In this meeting, team members provide updates on work progress, obstacles faced, and future work plans to ensure all team members stay in sync.
- **Sprint Review** to review the results of work with Product Owners and other stakeholders. At this stage, the team shows the work that has been completed and receives feedback for improvements or changes in the next Sprint.
- **Sprint Retrospective**, which focuses on the team's internal evaluation of the work process during the Sprint. The team discussed what has gone well, the obstacles faced, and how to improve performance in the next Sprint.
- **Finish Worked**, that is work that has been completed and is ready to be released or used. If there is any unfinished work, the item is returned to the Product Backlog to be reprioritized in a future Sprint. With this process, product development is carried out iteratively and continues to be improved.

3. Result and Discussion

a. System Analysis

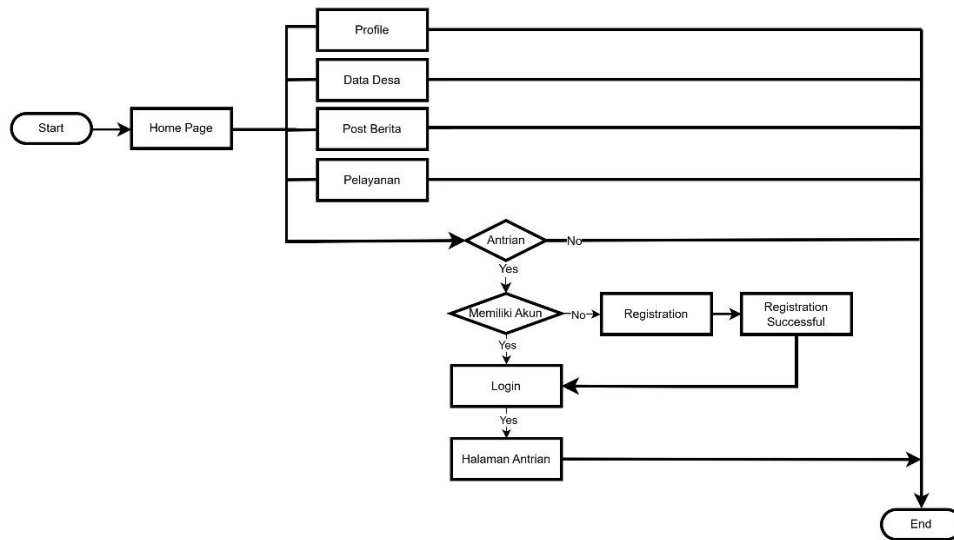


Fig 2. Flowchart user

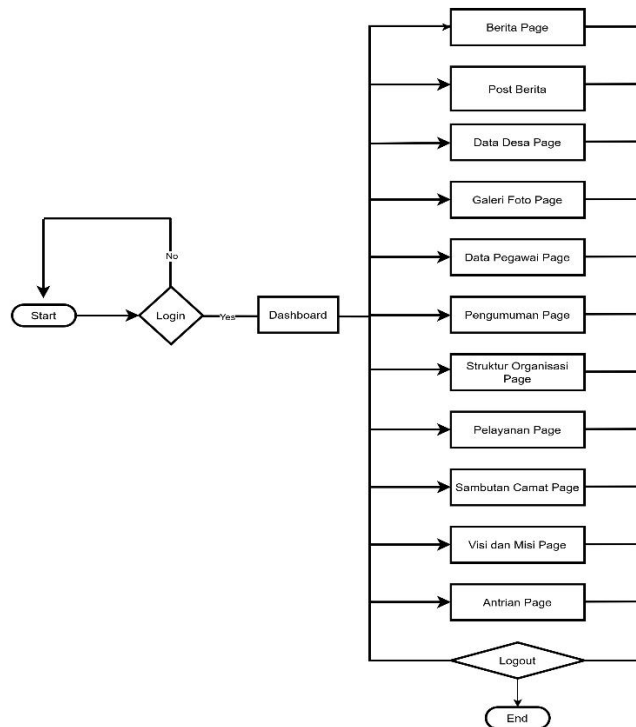


Fig 3. Flowchart admin

In Figure 2 and Figure 3 above is a flowchart of a web-based administrative service system. This system has a home menu, profile menu, Data Desa menu, news post menu, service menu, register menu, login menu, and queue menu.

b. System Planning

This system consists of the creation of data flow diagrams (DFD), entity relationship diagrams (ERD), and the creation of system interface designs that have been implemented into the Administrative Service Information System

1) Data Flow Diagram

Data flow diagram design is used to describe the interaction between the system and the user. Here is the DFD level 0 on the system to be built:

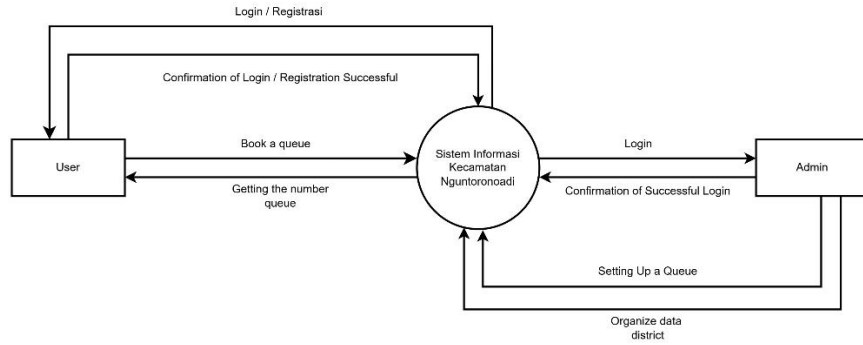


Fig 4. DFD Level 0

2 users, namely user and admin. Users can view information and register or log in to create a service queue. Admins must be logged in to manage the administration system. The following is DFD level 1 which is a continuation of DFD level 0, in DFD level 1 all processes are broken down into sub-processes, so that the appearance is more detailed, complete, and detailed. DFD level 1 can be seen in figure 3.

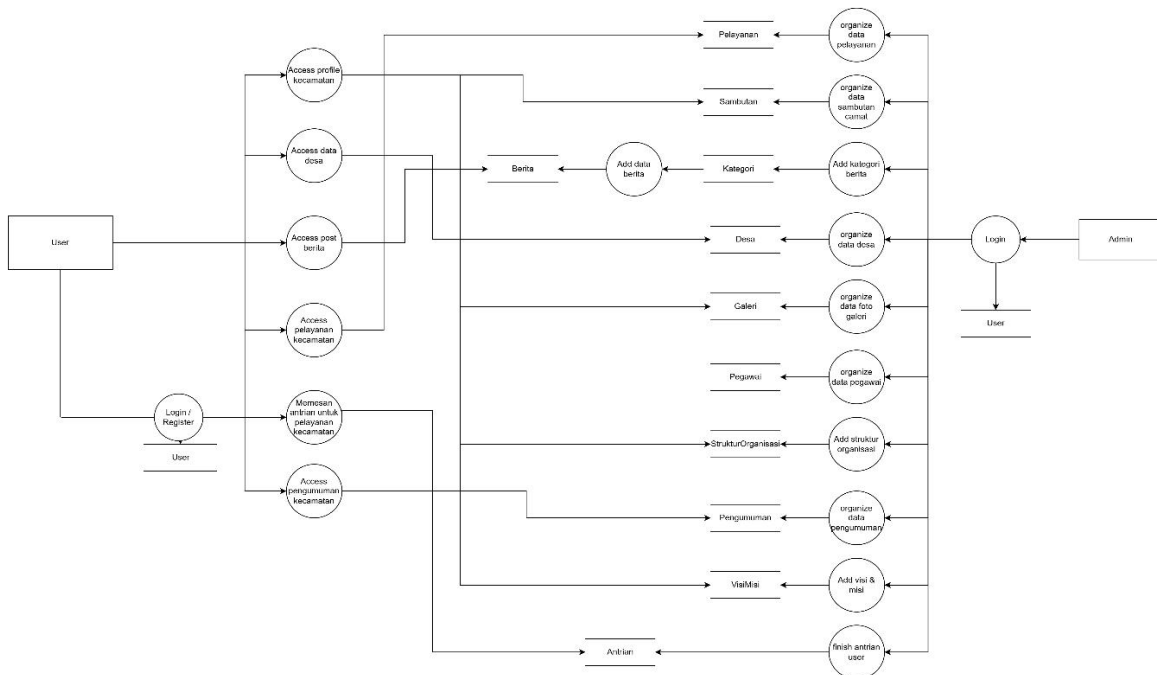


Fig 5. DFD Level 1

There is no need to log in to the system if you only want to see the Home page, Profile, Village Data, Services, News, and Announcements. But if you want to take a queue for administrative services, users must first log in to get the queue number. And admins can change and access existing data.

2) Database

In design of the system explained that users are only given access to manage queues. The structure of the user database to be built can be seen in the following Table 1.

Table 1. Database User

No	Field	Type	Lenght	Description
1	Id	Bigint	20	Primary key
2	Nama	Varchar	255	Username
3	Email	Varchar	255	Email user
4	Username	Varchar	255	Username user
5	Telephone	Varchar	255	Telephone user
6	Alamat	Varchar	255	Address user
7	Gender	Enum	'Laki-Laki', 'Perempuan'	Gender user
8	Password	Varchar	255	Password user
9	Role	Varchar	255	User

Then admin has access rights to manage all menus available in the system. The structure of the user database to be built can be seen in the following Table 2.

Table 2. Database Admin

No	Field	Type	Lenght	Description
1.	Id	Bigint	20	Primary key
2.	Username	Varchar	255	Username admin
3.	Password	Varchar	255	Password admin
4.	Role	Varchar	255	Admin

On the queue page that can be accessed by admins or users. The structure of the queue database to be built can be seen in the following Table 3.

Table 3. Database Antrian

No	Field	Type	Lenght	Description
1.	Id	Bigint	20	Primery key
2.	Id user	Bigint	19	Id user antrian
3.	Tujuan	Varchar	255	Purpose of Antrian
4.	Nomor KTP	Varchar	255	ID Number
5.	Tanggal	Date	255	Date antrian
6.	Status	Varchar	255	Status antrian
7.	Rencana Kunjungan	Time		Plan a visit
8.	Jenis Pelayanan	Varchar	255	Types of services
9.	Created at	Timestamp		Created at
10.	Updated at	Timestamp		Uploated at

c. System Implementation

The results of the implementation of the Administrative Service Information System Design interface in the home section are shown in figure 6.

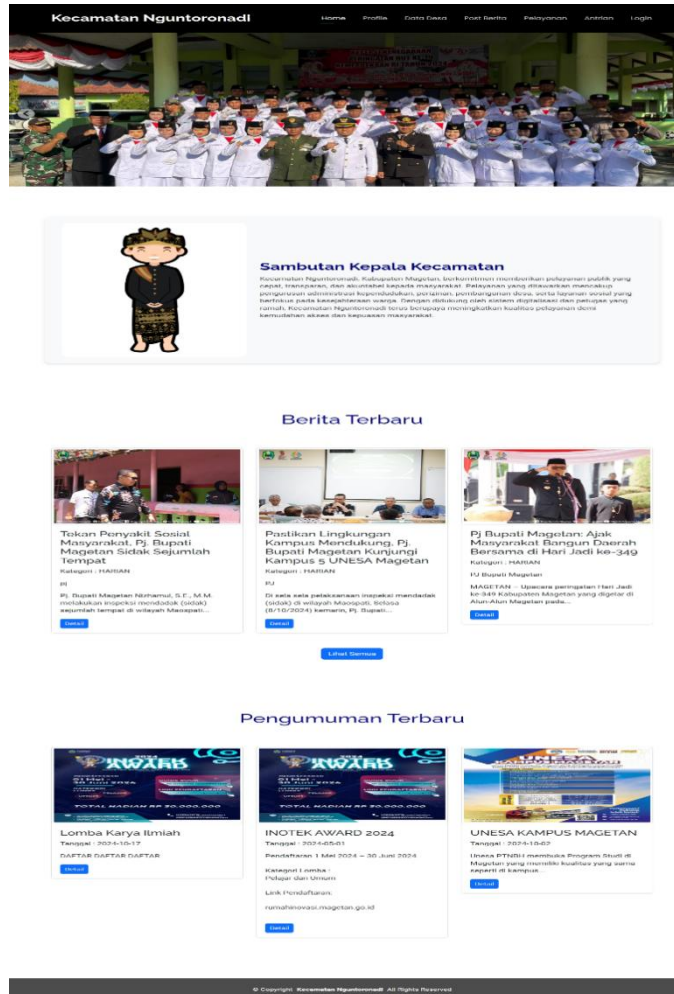


Fig 6. Interface home

The implementation of the Administrative Service Information System Design interface in the Data Desa section is shown in figure 7.

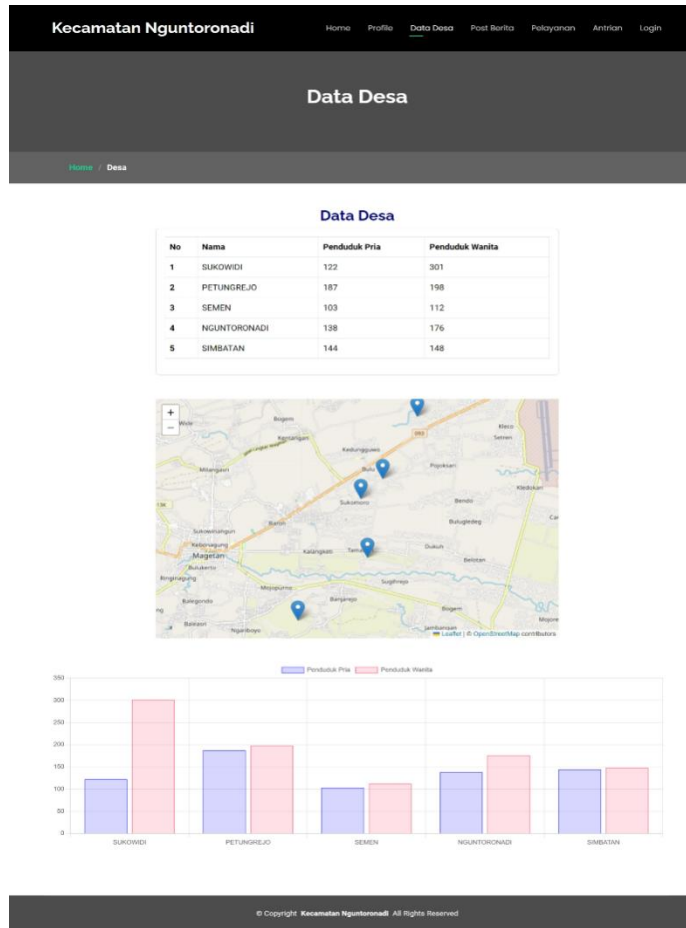


Fig 7. Interface Data Desa

The implementation of the Administrative Service Information System Design interface in the registration section is shown in figure 8.

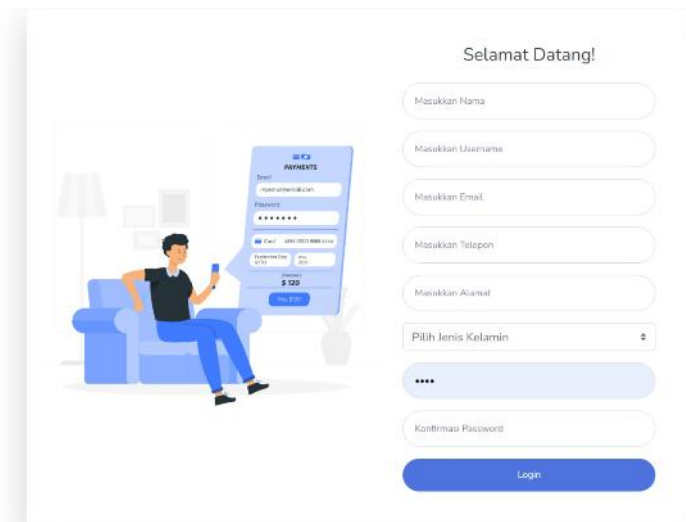


Fig 8. Interface register

The implementation of the Administrative Service Information System Design interface in the login section is shown in figure 9.

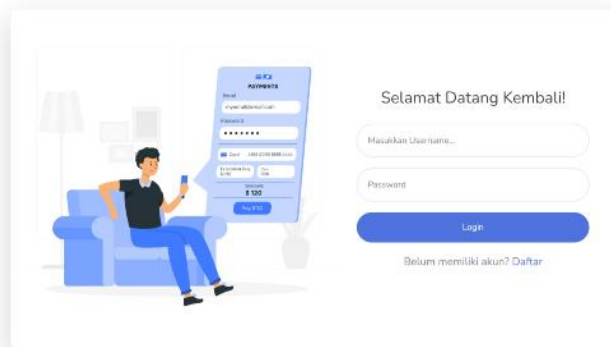


Fig 9. Interface login

Data Desa page, information on the number of men and women population is presented concisely in the form of diagrams and tables to provide a more informative and easy-to-understand visualization shown in figure 10.

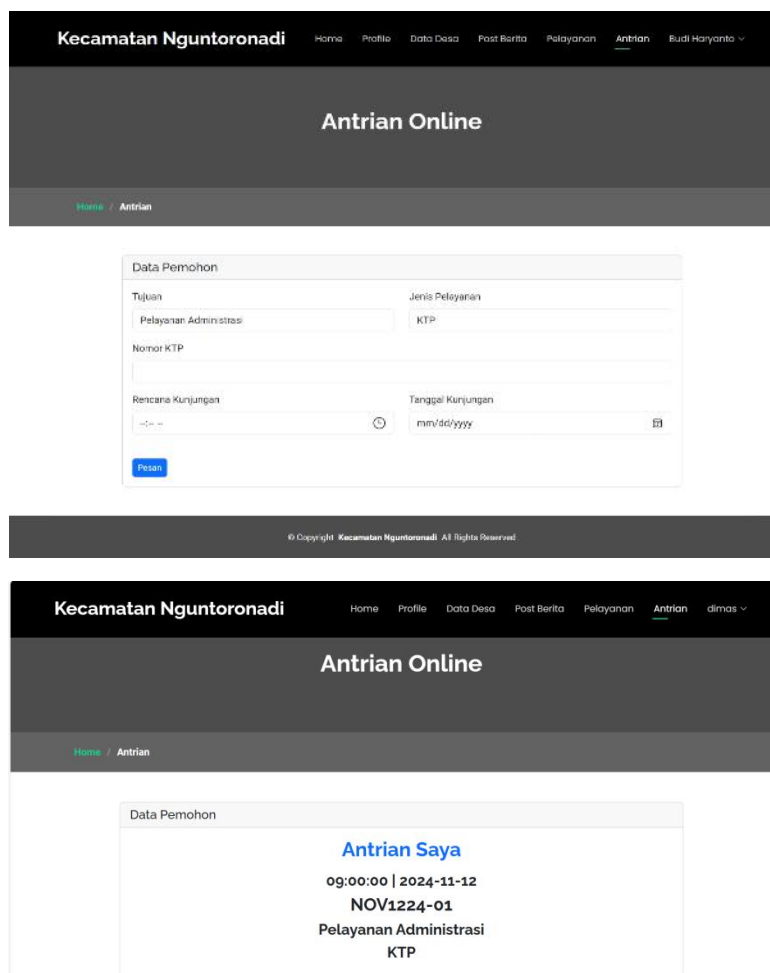


Fig 10. Interface Antrian Online

Online Queue page, this page presents complete and structured service queue applicant data shown in figure 11.

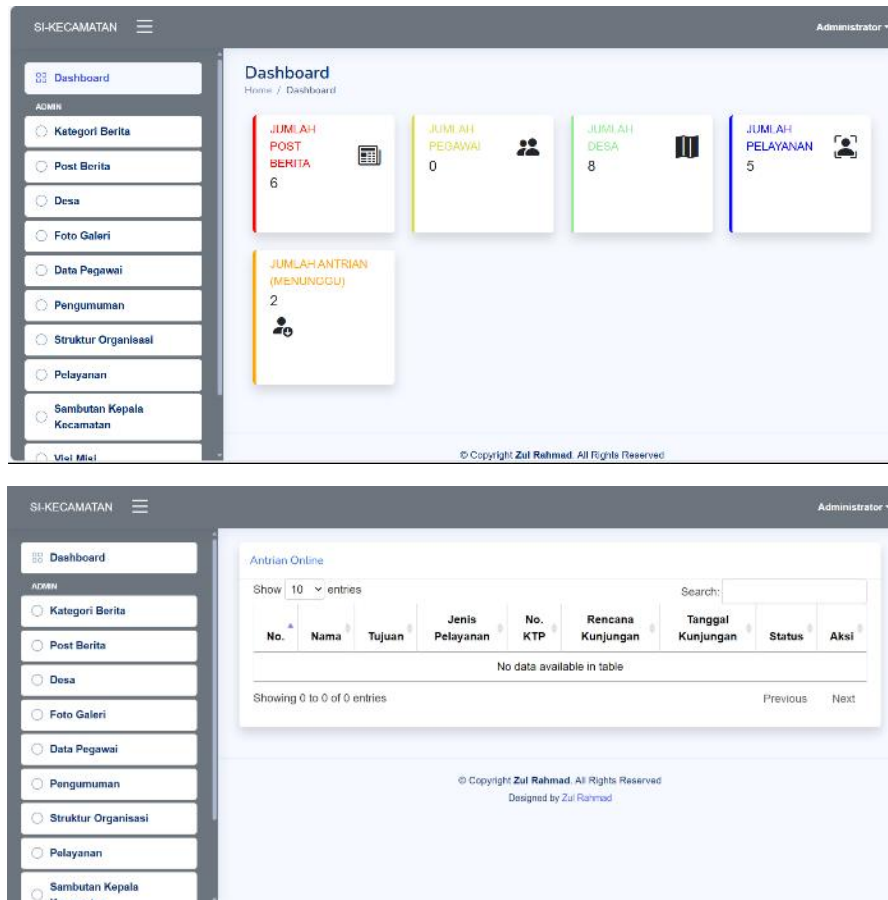


Fig 11. Interface dashboard admin

d. System Testing

The test carried out on the Web-based Administrative Service Information System uses the Black Box test method. Black Box testing is a testing method that focuses on testing the functionality of a system without looking at the internal structure or program code. The goal is to ensure that the system functions according to the desired needs and specifications, based on the inputs provided and the outputs produced. The purpose of this test is to ensure that the test results are in line with the expectations that have been set. The following are the results of the Web-based Administrative Service Information System test:

Table 4. Pengujian Sistem User

No	Menu testing	Input Data	Expected results	Test results	Conclusion
1.	Home	Select the home menu	Displaying the home page	Displaying the home page	[v] Succes [] Failed
2.	Profile	Select the profile menu	Displaying a profile page	Displaying a profile page	[v] Succes [] Failed
3.	Data Desa	Select the village data	View village data page	View village data page	[v] Succes [] Failed

		menu				The test
4.	Post Berita	Select the post news menu	Displaying a news post page	Displaying a news post page	[v] Succes [] Failed	
5.	Pelayanan	Select the service menu	View the service page	View the service page	[v] Succes [] Failed	
6.	Register	Enter your name, username, email, phone, address, select gender, and password Then click login	Log in on the login page	Log in on the login page	[v] Succes [] Failed	
7.	Login	Enter your username and password then click login	Enter the home page	Enter the home page	[v] Succes [] Failed	
8.	Antrian	Select the queue menu	Displaying queue pages	Displaying queue pages	[v] Succes [] Failed	

results in Table 1, it can be concluded that all features in the user menu have functioned well as expected. The test includes various important menus such as login, dashboard, news categories, village data, photo galleries, as well as service menus and queues. All tests gave satisfactory results, marked by a "Successful" status on each feature. This shows that the system can run without problems in every part tested, and achieve a success rate that is in accordance with the set targets.

4. Conclusions

The research that has been carried out, it can be concluded that the design and development of the system is carried out by paying attention to user needs and combining the main features needed. The resulting system makes it easier for users to access administrative services and manage data. Testing the system using the black box method shows the results that all designed features function well, according to expectations, and make it easier for users to manage administrative services. This system is effective in improving the convenience and quality of web-based administrative services.

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