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Design of Web-Based Taxpayer Data Collection Information System

Perancangan Sistem Informasi Pendataan Wajib Pajak Berbasis Web

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A B S T R A C T

The aim of this research is to design a taxpayer data collection administration website to make it more accurate, work efficiency and effectiveness better and increase work efficiency and effectiveness. To solve the problem of less than optimal tax payer data collection. In this research, the waterfall method was used. And this system is designed to help officers collect taxpayer data better and more easily via the website. It is hoped that the results of the research will make it easier for officers to carry out their duties and increase efficiency in serving taxpayers at KPP Pratama Medan Petisah. And it can be concluded that the web-based taxpayer data information system designed using the waterfall method has succeeded in overcoming the challenges of efficiency and effectiveness of tax data collection.

Keyword: information system, data collection, waterfall method

A B S T R A K

Tujuan dari penelitian ini adalah untuk merancang sebuah website administrasi pendataan wajib pajak agar lebih akurat, meningkatkan efisiensi dan efektivitas kerja, serta mengatasi permasalahan pendataan wajib pajak yang selama ini kurang optimal. Dalam penelitian ini digunakan metode waterfall. Sistem ini dirancang untuk membantu petugas dalam mengumpulkan data wajib pajak dengan lebih baik dan mudah melalui website. Diharapkan hasil dari penelitian ini dapat mempermudah petugas dalam menjalankan tugasnya serta meningkatkan efisiensi dalam melayani wajib pajak di KPP Pratama Medan Petisah. Dari hasil penelitian dapat disimpulkan bahwa sistem informasi pendataan wajib pajak berbasis web yang dirancang dengan metode waterfall ini berhasil mengatasi tantangan efisiensi dan efektivitas dalam proses pendataan pajak.

Kata kunci: sistem informasi, pendataan, metode waterfall

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1. INTRODUCTION

In the current era of globalization and information, the role of information systems has become one of the absolute requirements or keys to success that must be understood and applied by all organizations, both private (private) and public (government). Almost all organizational activities, such as government activities, business / business, banking, service to customers or consumers (customers)[1]. Information Systems are a number of components (human, computer, information technology, and work procedures), something is processed (data becomes information), and is intended to achieve a specific goal. An information system has an important role in activities that occur in a government agency, including in storing, processing and making tax collection financial statements[2][3]. Or Information systems are activities that cover all aspects of the acquisition (gathering), combining (combining), storing (storing) and using (using) information to achieve certain goals of making a system[4]. Information technology can be used as a tool in decision making. This information system is used as material to obtain search results from a subject matter. The results of this information system are expected to provide solutions and make appropriate decisions. This information system can be used as a tool for data processing that can make information quickly and precisely when needed[5].

And with the development of advanced technology we can process data with applications that exist today, because the data in the Medan Petisah Primary Tax Service Office is very many kinds and types. The nature is fixed and there is always changing[6][7]. With the development of existing information technology systems used to achieve optimal government performance[8]. The use of Information Technology in daily activities is very important, it is useful in supporting a much better life[9][10][11] [11]. Technology has its own positive value, namely technology can be used to facilitate information search, data collection, and daily needs[12].

The problem that occurs is in the process of tax administration services, in this case registration and data collection at the tax office has not been maximized because one file is handled by several officers, if one officer does not come, the file will pile up on the table. This service process makes officers work repeatedly and makes taxpayers have to wait or go home[13][14]. His happens because public services provided by government institutions have not been able to meet the expectations and demands desired by the community, in an effort to improve the quality of public services, the use of information technology in the government environment is known as e-Government. "The e-Government system is generally defined as the use of information and communication technology in the public sector to improve the quality of operations in delivering services[15][16][17]. Manual systems and processes are switching to computer-based systems and processes. These computer-based systems and processes are called Information Systems[18][19]. The service quality benchmarks that need to be applied such as in terms of physical, communication, security, politeness, responsibility, good response, direction, consistency, and good ability in service[20].

To deal with these problems, in addition to implementing policies, other things such as the use of data and technological innovation are also considered to be able to make a positive contribution to achieving this[21]. So the rapid development of information technology accelerated by the presence of the internet has encouraged various areas of life to utilize this technology as optimally as possible. The development of technology and information that we feel today has a major influence, especially in the world of work. One of them is the use of computers that can simplify and expedite work.And with the existence of this web-based tax management information system, it is expected to be a solution to solve problems in tax management that are almost always encountered by tax officers[22]. The development of computer technology has an impact on various fields including land and building taxes[23].

The solution to the above problem is to create a web that can facilitate the administration in carrying out taxpayer data collection and can facilitate the Medan Petisah Primary Tax Service Office in providing more effective and efficient taxpayer data collection administration services.The service quality benchmarks that need to be applied such as in terms of physical, communication, security, politeness, responsibility, good response, direction, consistency, and good ability in service.

Previous related research was conducted by Pratama, et al [24] entitled Land and Building Tax Monitoring Information System in Klangenan Village, Klangenan District, Cirebon Regency. The difference between this research and the previous is the system development method, where the research uses prototype system development, while this research uses waterfall system development methods, flowcharts, and use case diagrams.

The purpose of this study is to design a taxpayer data administration web to be more accurate, more efficient and more effective work. With the use of a data collection administration system or web at the tax office so that it can be used by more than one user and create an information system that produces accurate taxpayer data reports so that it can help agencies in making strategies in the future[25].

2. METHODOLOGY

In this research there are several stages, namely the stages of data collection and system development methods. The figure below is a research flow chart that will be used to design a Web-Based Taxpayer Data Collection Information System.

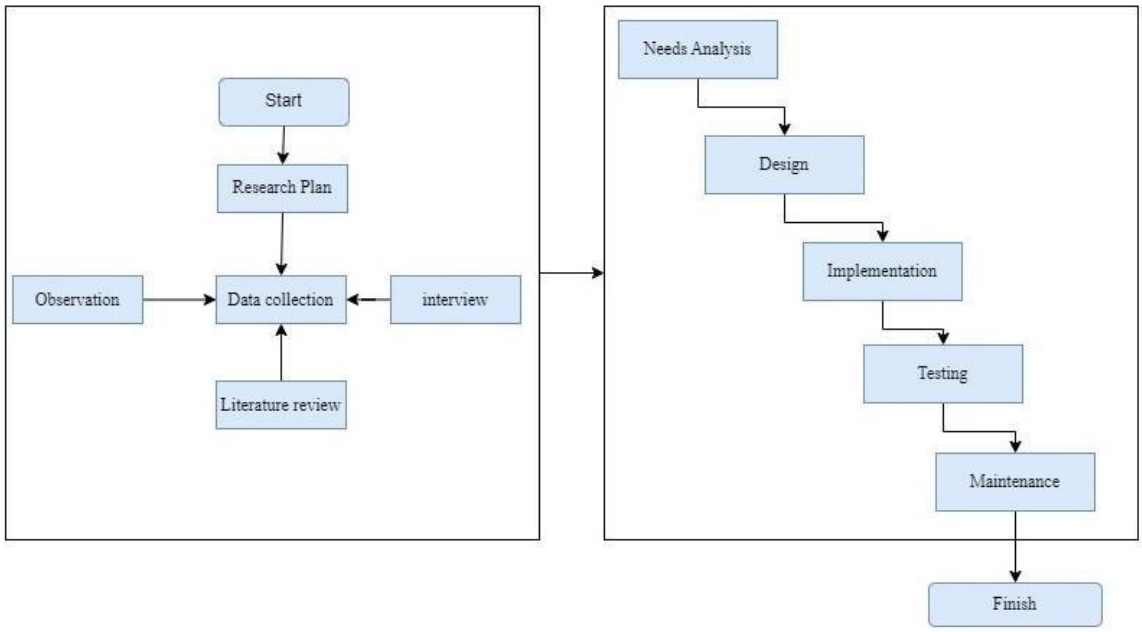

Figure 1. Research flow chart

Based on the picture above is a process in research and explained as follows:

1 Research Plan

The research plan for the research plan is carried out at the Medan Petisah Primary Tax Service Office.

2 Data Collection

In this research, I used data collection techniques, which are methods used to collect information from various sources for research purposes. This data collection technique includes observation, interviews and literature study.

3 Observatiom

Observation is direct observation of employee activities and activities institutions.

4 Interview

Interviews are a technique for collecting personal data to reveal problems experienced.

5 Literature review

This library study is operated by searching journals related to the research conducted.

6 Needs Analysis

At this stage the developer must know all information about software needs such as the usefulness of the software desired by the user and software limitations. After that the information is analyzed so as to obtain complete data about user needs for the software to be developed.

7 Design

The next stage is Design. Design aims to provide a complete picture of what must be done and how the desired system looks.

8 Implementation

In carrying out the implementation stage, there are several things that must be considered, such as ensuring that the system implemented is in accordance with the design that has been made and at this implementation stage a more detailed examination process is also carried out related to the system made to ensure its function runs normally.

9 System Testing

In the testing phase aims to check the performance of the software, whether it is running well or not. In addition, software testing can also help developers prevent errors or bugs in the program.

10 System Maintenance

After completing the above stages, development enters the final stage of operation and maintenance. Maintenance is an important part that continuously accompanies the operation of the software. Its purpose is to ensure the performance, reliability and security of the program. This maintenance process includes many things, ranging from system updates, bug fixes.

3. RESULTS AND DISCUSSION

1. Use Case Diagram

Use Case Diagram is a type of diagram in UML (Unified Modeling Language) that is used to describe the interaction between a system and the various entities (actors) that interact with that system. Use case diagrams help in modeling the functionality of the system from the point of view of users or actors. The use case diagram image can be seen in the picture below.

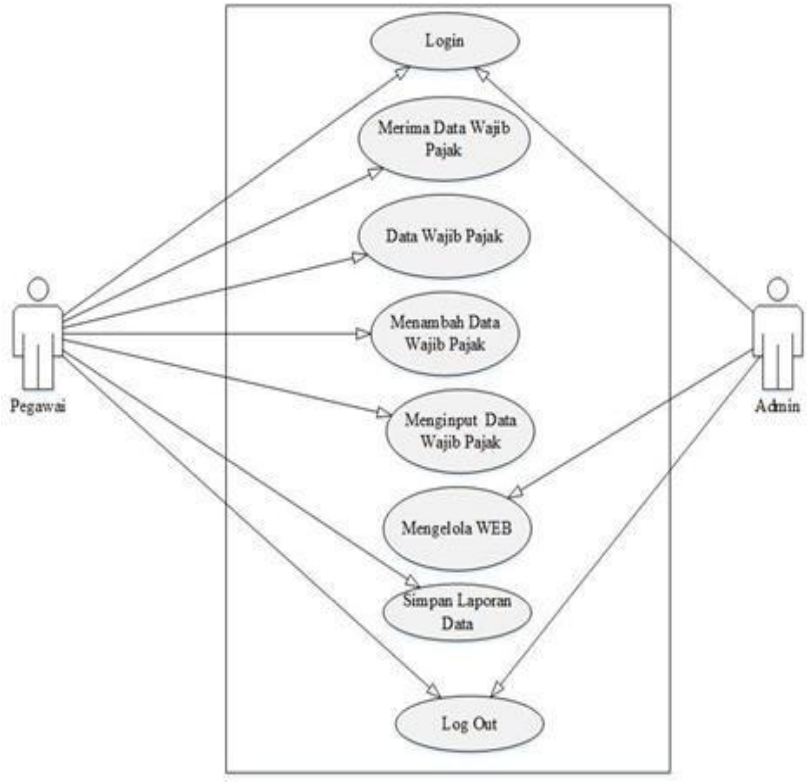

Figure 2. Use Case Diagram

2. Class Diagrams

Class Diagrams are used to illustrate the static structure of a system, focusing on the classes that exist in the system and the relationships between those classes. The following class diagram can be seen in the picture below.

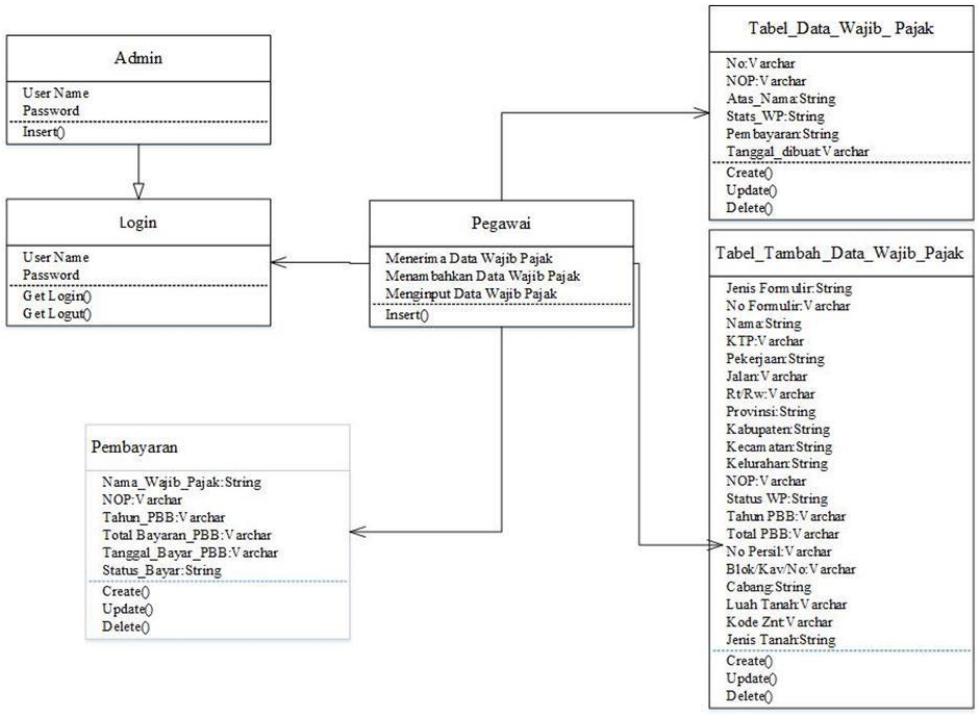

Figure 3. Class Diagrams

3. Implementation

a. Login Page Display

The display below is a login page that contains a username and password that must be filled in to enter the next page or display.

Figure 4. Login view

b. Dashboard

Page view In the view below is a dashboard page that contains taxpayer data, adding taxpayer data, and payments to create new data collectio.

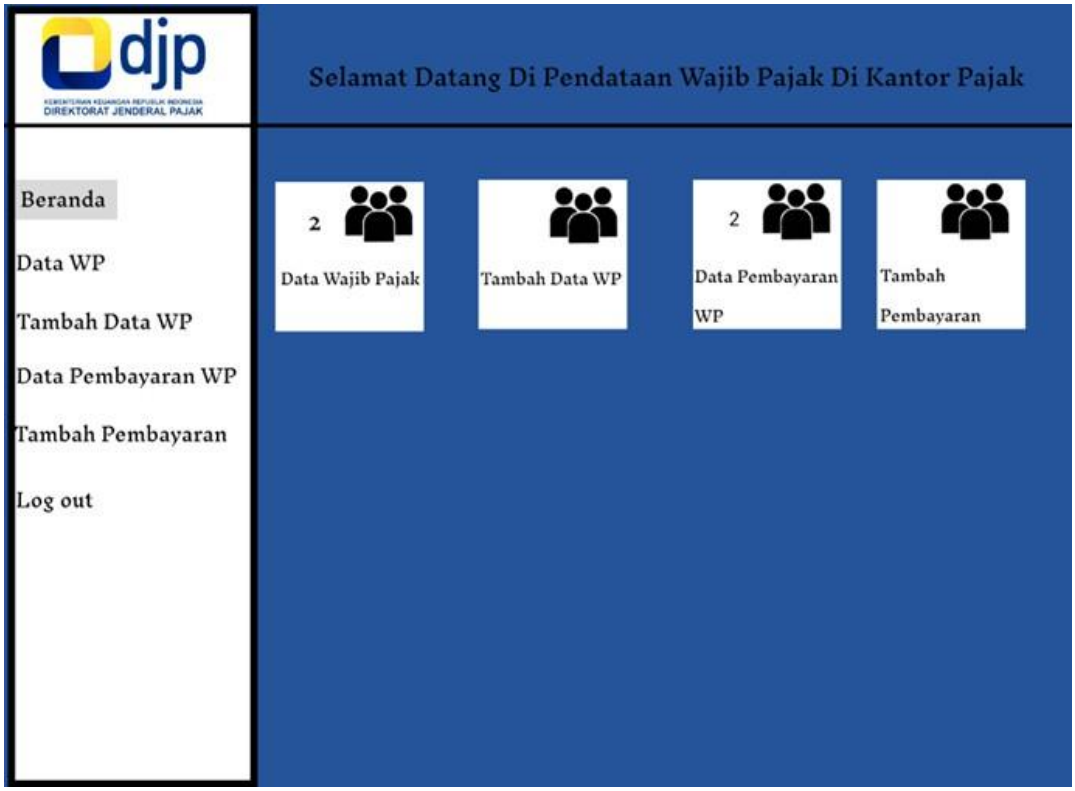

Figure 5.Dashboard page

c. Taxpayer data page

The display below is a display of taxpayer data that contains taxpayer data and can also add taxpayer data. Which in the data must contain nop, on behalf of, wp status, payment, date made and action.

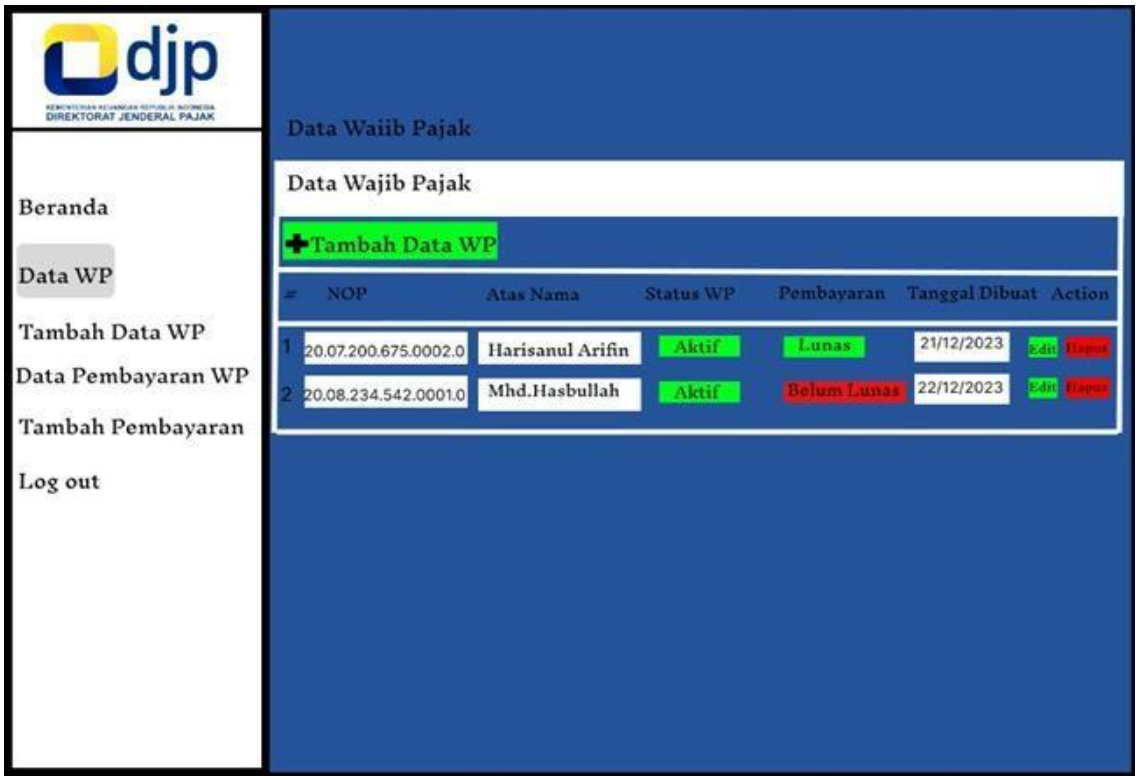

Figure 6. Taxpayer data page view

d. Display of the add taxpayer data page

The display below is a display for adding taxpayer data or taxpayer data containing taxpayer personal information.

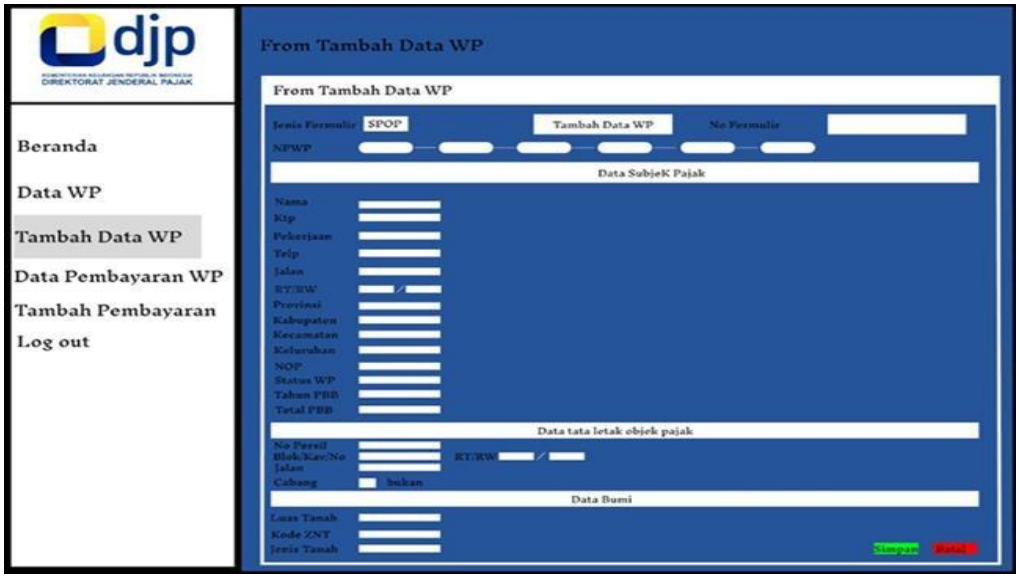

Figure 7. Display of the add taxpayer data page

e. Payment data page view

This view is a view of the payment data view containing taxpayer payment data. Where in the taxpayer payment data contains the taxpayer's name, tax object number, un year, total un payment, date paid and payment status.

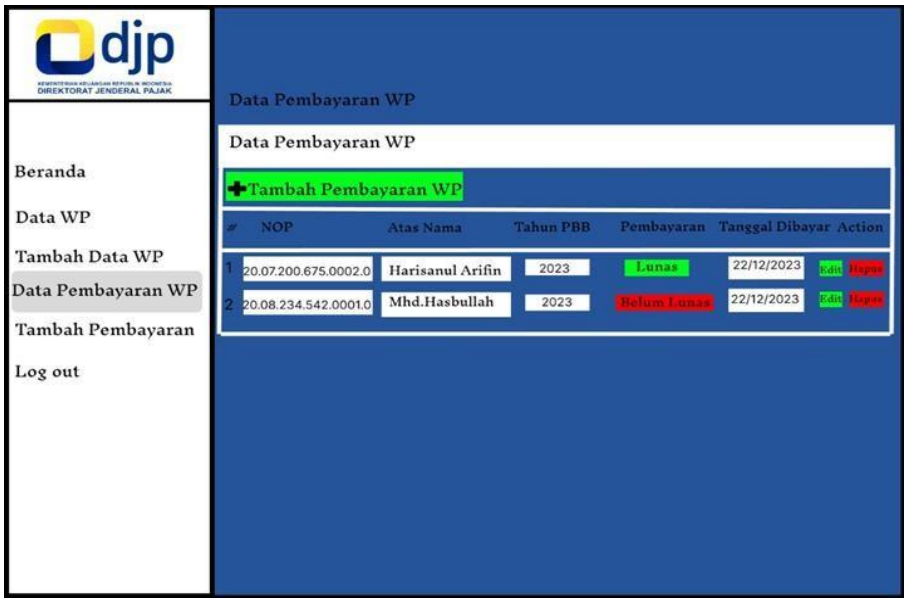

Figure 8. Payment data page view

f. Display of the add payment page

The display below is a display of payments and taxpayers and add payments containing personal data of taxpayers and building data. Such as taxpayer name, nop, un year, total un pay, pay date, and pay status.

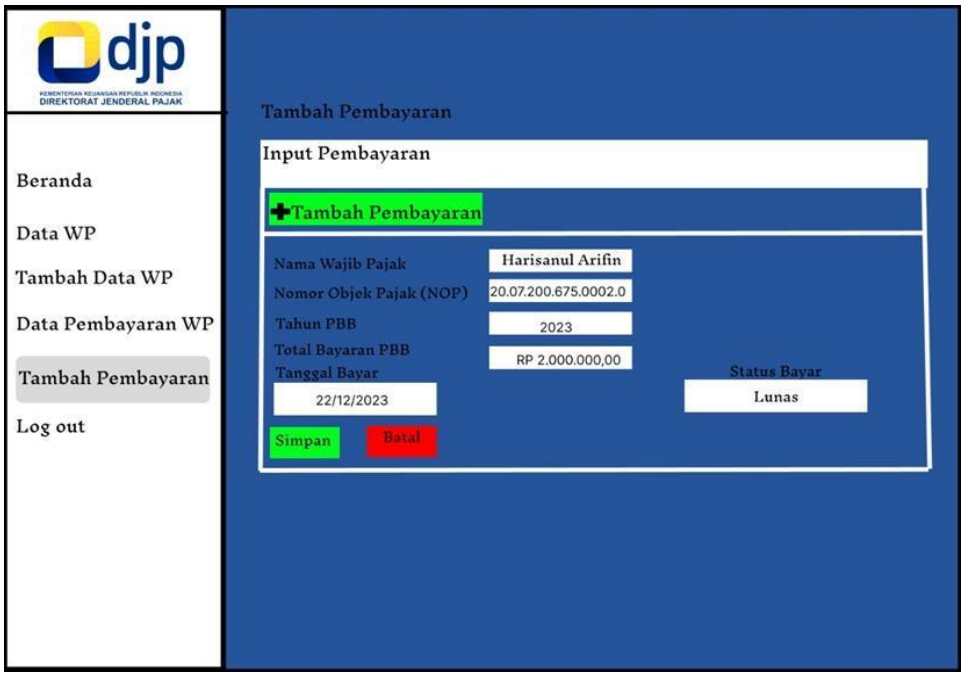

Figure 9. Display of the add payment page

Tabel 1. Testing

No	Tested views	Actions taken	System reactions	Result
1.	Login page view	Fill in the username and password correctly, then click login	Continue to the next page/dashboard display	Valid
2.	Dashboard page view	Can operate the system by selecting menu selection	Will display the page clicked on the dashboard menu	Valid
3.	Taxpayer data page view	Can view taxpayer data and can create new taxpayer data.	Display form from taxpayer data	Valid
4.	Display of the add taxpayer data page	Can fill in fields or add taxpayer data and if it is ready to be filled continue to be saved.	The system will store the newly added taxpayer data.	Valid
5.	Payment data page view	If we click on the payment data page, taxpayer	Will display the page add taxpayer payment.	Valid
6.	Display of the add payment page	Input new payment taxpayer data	Can input or fill in new taxpayer payments.	Valid
7.	Logout	Click Log out	Will exit the taxpayer data collection display and will Return to the login page	Valid

The implementation of a web-based taxpayer data collection system using the Waterfall method has proven to improve the accuracy and efficiency of tax data management at KPP Pratama Medan Petisah. The results of this study are consistent with the findings of Fatturohman and Ilyasa [3] who emphasized that the use of web-based systems in tax data collection enables the optimization of tax reporting and service transparency through better structured data flows.

The system was developed with several main features including a login page, dashboard, taxpayer data management, and payment tracking. Each feature was successfully tested and validated through black-box testing (Table 1) where all actions from login to logout operated correctly. This result aligns with Dewi et al. [11] who also found that the integration of structured system components improves administrative processes and accountability.

The Use Case Diagram and Class Diagram in the system demonstrate a structured design that reflects user-system interaction and object relationships. According to Sutejo and Tanaamah [10], visual modeling through UML is essential in ensuring clarity of system functionality which facilitates both development and future maintenance.

On the taxpayer data page, officers can not only view but also input and manage detailed taxpayer information. This approach ensures the accuracy of taxpayer identity and financial data which, according to Asari et al. [4], is a critical factor in supporting decision-making and regional revenue optimization. The system's ability to store payment data such as UN year, tax object number, total paid, and payment status helps maintain up-to-date taxpayer profiles. This capability is essential for supporting self-assessment models as also described by Wijaya and Devitra [16].

In terms of operational benefits, the use of the system reduces manual data entry, minimizes human error, and increases the speed of administrative processes. This finding supports the study by Ghara et al. [7] which emphasized that digitization of regional revenue systems improves both internal workflow and service quality to the public.

Furthermore, the system provides accountability and auditability in the data collection process. The recorded data can be used for evaluation and policy planning. This is in line with the findings of Pratama [21] who suggested that integrated tax systems can support the development of data warehouses for better financial monitoring.

The implementation of the Waterfall model was particularly suitable for this project considering the well-

defined project scope and predictable system requirements. According to Ismai [18], the Waterfall approach ensures structured and linear development making it effective for administrative systems like this one.

From a governance perspective, this system also supports the realization of e-Government in local tax services in accordance with Sitopu's [15] research on the impact of digital transformation on tax service delivery. By enabling online access and data processing, the system encourages transparency, improves public trust, and supports digital governance initiatives.

In conclusion, the research findings reinforce the value of using a web-based system in government tax offices. As Ariansyah [5] and Utomo et al. [17] also suggested, implementing digital services improves user satisfaction particularly when it supports accurate and timely information delivery. This system not only enhances the internal performance of tax officers but also aligns with the broader goals of modernizing public services in line with national tax reform strategies.

4. CONCLUSION

From the research results, it can be concluded that the web-based taxpayer data collection information system designed using the waterfall method has succeeded in overcoming the challenges of efficiency and effectiveness in tax data collection. And the results of this research can improve the performance of officers in collecting taxpayer data more efficiently and accurately. Thus, these conclusions provide a clear picture of the benefits of the designed information system and its relevance in the context of designing a web-based taxpayer data information system.

The use of a data management system or website at the tax office can help the tax office in formulating future strategies by creating an information system that can be used by many users and produce accurate tax data reports.

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