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Customer Service Information System: Service Improvement Solution PT. Jaringanku Sarana Nusantara

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ABSTRACT

One of the companies actively involved in the field of information technology systems, especially in the Internet sector is PT Jaringanku Sarana Nusantara. The company has paid services using E-invoice with payment gateway method but on this payment system has not been integrated with microtic devices to perform the disconnection of the Internet for customers who have not paid. This process is carried out through microtic configuration performed by the officers. If the customer's connection termination is missed within the specified limits, the company risks losing the bandwidth cost by continuing to provide internet services without receiving payment on time. In addition to payment services, the company also has a complaint service that uses the WhatsApp app as a medium of interaction with customers, found several problems that need to be addressed. One of the problems was when the admin sent customer data and gave the task division to the team of officers through the WhatsApp group. This research uses the waterfall methodology of a systematic model to develop this system so that it is structured starting from the phases of design, analysis, design, implementation, operation, to the maintenance of the system. The results of this research showed that it was possible to build a service information system at PT. Jaringanku Sarana Nusantara by performing blackbox testing, then it is known that the system is running correctly and in accordance with the expected plan.

1. Introduction

An internet service provider or often called ISP (Internet Service Provider) is a company engaged in technology, especially the internet. The purpose of ISP service providers is to ensure equitable internet access in every region, both through wireless and wired connections (Hanafizadeh et al., 2019, 2021). One of the companies actively involved in the realm of information systems technology, especially in the internet sector is PT Jaringanku Sarana Nusantara. With their commitment to become an internet service provider with equitable access to areas that have not been touched by home internet access, this company plays an important role in connectivity in various regions and helps overcome digital access inequality.

PT Jaringanku Sarana Nusantara which is located at Jln. Gunung Agung No.18, Beng, Kec. Gianyar, Kab. Gianyar which operates from 9:00-21:00 with more than 1,500 customers. The selection of this research object is motivated by the first reason that this research object has interesting problems to be studied. The results of this study are expected to provide insight and knowledge about the fast service information system until the company's management is more structured.

Based on the results of observations and interviews conducted by the author to the supervisor of the company PT Jaringanku Sarana Nusantara, the payment process uses the E-invoice method, a service from paper.id. In this system, using the payment gateway method, where the tagiahan invoice

is sent to the customer via WhatsApp and Email. After the customer receives the invoice and makes a payment, the system will automatically provide a paid status. Conversely, if the customer misses the specified payment due date, the system will give an overdue status. However, on the last day of payment due date, the admin must manually check one by one from the paper.id application to cut off internet connections for customers who have not paid. This process is carried out through the proxy configuration carried out by the officer. If customer disconnection is missed according to a predetermined limit, the company risks losing bandwidth costs because it continues to provide internet services without receiving timely payments. In addition, this can create financial disruption, disrupt the company's cash flow, and provide a bad experience for customers who have made payments (Nurninawati et al., 2023; Pradnyani et al., 2024). Delays in reactivating the internet connection of paying customers can also limit customers' access to essential services. To address these issues, companies can consider implementing an automation system that can guarantee timely disconnection in the case of payment arrears, and automatically reactivate the connection upon receipt of payment. This will not only safeguard the company's finances but also improve customer relations and maintain the company's positive image.

In addition, in the process of company complaints services using the WhatsApp application as a medium of interaction with customers, there are several problems that need to be overcome. One of the problems is when the admin sends customer data and assigns tasks to the officer team through the WhatsApp group. In this complaint service, the data sent by the admin can be scattered between communication between the admin and other officers, especially if the company has many officers. Of course, it will hinder officers in finding the data they want to find. To overcome the challenges faced, this research proposes the development of a Service Information System at PT Jaringanku Sarana Nusantara. This system will be developed with a web base and Android application to ensure more flexible access for users. The main objectives of this Service Information System are to improve customer data management, payment services, and complaint mechanisms, ensure that every information is recorded properly in the system, and provide a deep understanding for the company regarding the response given to customers. Thus, PT Jaringanku Sarana Nusantara can optimize problem solving, strengthen customer trust, and improve overall service quality. Through the implementation of the proposed Service Information System, it is hoped that the company can better maintain customer satisfaction and strengthen the company's position in industry competition (Hunter et al., 2019; Lee & Lee, 2020).

2. Literature Review

Related research is research conducted by (Galih et al., 2023) with the topic of designing a website-based relationship management (CRM) system in website development designers use qualitative research methods with development models using waterfall . In developing an online payment system, the author uses payment gateway technology that is directly connected to the bank's virtual account. for system development the author uses the PHP programming language with the Codeigniter framework and the DBMS used MySQL as a database server or data management. The result of this research is a payment information system service that helps customers make payments online and the reporting disorder feature provided helps make it easier for customers to report (Riyanti et al., 2024; Rohman & Subarkah, 2024).

The next related research is research conducted by (Fahmi & Murniati, 2023) with the research topic e-SCM Internet Service Provider (ISP) Case study of PT. Rinjani Citra Solusi. The research conducted has case studies or problems in checking modems, checking fiber cables, monitoring bandwidth capacity and other services. To overcome these problems, the Electronic Supply Chain Management (e-SCM) application was made. the method used by the author in this research is a qualitative method using a waterfall approach. In the coding process, the author uses the PHP programming language with database management using mariaDB and the results of this study with the Electronic Supply Chain Manajement (e-SCM) system, the company and customers can be well integrated so that the internet service process does not have delays in customer complaints which result in the sustainability of the company.

The next related research is research conducted by(Fahmi & Murniati, 2023) with the topic of Electronic Relationship Customer Manajement (E_RCM) System Design at the Internet Service Provider (ISP) company in the research conducted by the author found problems in marketing that are still slow because they are still only waiting for customers to come and inadequate reporting of

customer complaints resulting in unknown levels of customer satisfaction. From the problems found, a system is made to service complaints or problems that are being faced by customers. In designing the system the author uses a waterfall approach and in the coding process the author uses the PHP programming language using the Laravel framework with the testing stages carried out using blackbox testing. The results of this study produced an E-RCM system that can help the admin to manage customer data and schedule technicians to install internet networks.

Next related research is research conducted by(Agustian et al., 2022) with the research topic of developing a web-based payment information system and interruption services in the problem studied where the payment system still requires confirmation to update payment data. This causes the service at the company to be less satisfying in the morning service. To overcome this problem, the author makes the development of an online payment information system (payment gateway) and disruption services so that it can continue to quickly monitor everything that happens both in payments and in customer complaints. In developing the system the author uses the waterfall method and uses the PHP (Hypertext Preprocessor) programming language for DBMS which is used as data management using MySQL. The results of this study the system runs well and helps companies in the services provided to customers including online payment methods that can transact anywhere and anytime

3. Research Methods

The following is a mechanism for the series of events of the complaint ticket process for customers proposed at PT. Jaringanku Sarana Nusantara, here are the procedures.

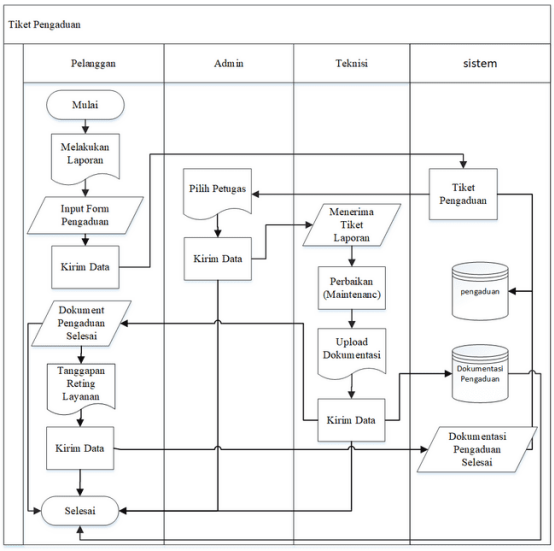

Fig.1. System Flow Diagram of The Complaint Process

Figure 1 is a mechanism of a series of business process events from reporting network problem tickets submitted to PT Jaringanku Sarana Nusantara, following the steps:

1. Starting with the customer reporting a problem with the network that is happening then the customer will send the problem that has been inputted from the complaint and then it will be received by the admin, the report will be stored in the complaint report table database.
2. After the report ticket is sent, the admin will select the officer who will handle the complaint.
3. Customers will receive an output in the form of a handling schedule
   If the complaint ticket has been received by the customer, the technician will carry out repairs to the location and after completing the repair the team in charge will upload evidence or documentation of the repair which will be stored in the documentation table database.

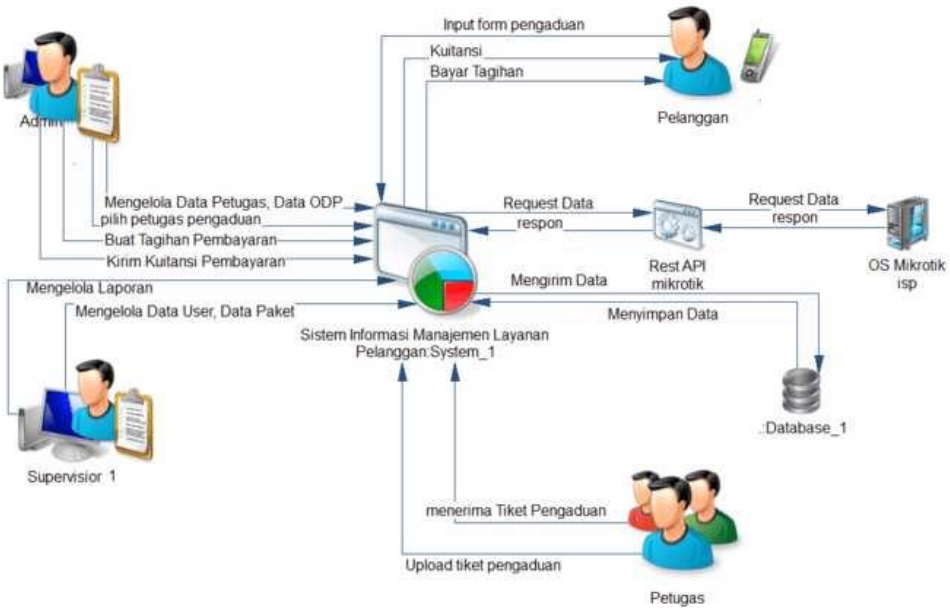

Fig.2. Overview of The Proposed System

Figure 2 is a flowchart of a customer service management system that illustrates the interactions between the various components and parties involved. The following is an explanation of the elements in the figure:

1. Customer: Input the complaint form and make the bill payment. They can also receive a receipt as proof of payment.
2. Admin**:** Responsible for managing officer and ODP (Ontarget Delivery Points) data, as well as creating and sending payment receipts.
3. Supervisor 1**:** Manages reports and user data. This also includes monitoring and supervising the work of officers.
4. Officer**:** Receive the complaint ticket and upload the ticket into the system for further processing.
5. Customer Service Management Information System: A server or application that handles data requests and stores customer information and reports.
6. Mikrotik Rest API: Used to interact with the ISP's Mikrotik device to manage customer service-related networks.
7. Database: Where all the data required by the system is stored, including customer information, complaint tickets, and reports.

From the overview described in Figure 2, the Conceptual data model (CDM) is designed database flow structure of the entire data application. In the information system Servicesan PT. Jaringanku Sarana Nusantara has nine database tables, namely the user table table, customer table, officer table, payment table, bill table, package table, ODP table, complaint table, complaint documentation table. For more details can be seen in Figure 3.

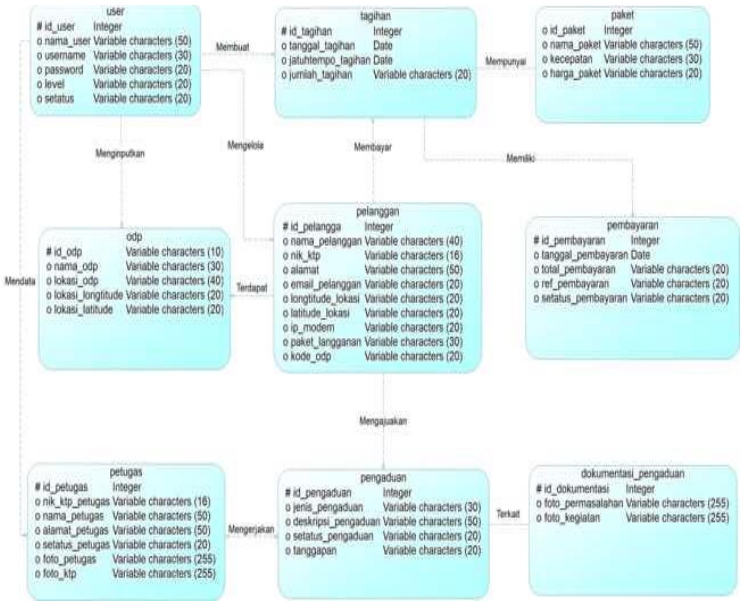

Fig.3. Conceptual Data Model

Physical Data Model (PDM) is a modelization of the database that will be created by taking into account the DBMS that will be used. PDM is generated from Valid CDM. The following is a description of the Physical Data Model (PDM) of the Service Information System at PT Jaringanku Sarana Nusantara. For more detail can be seen in Figure 4.

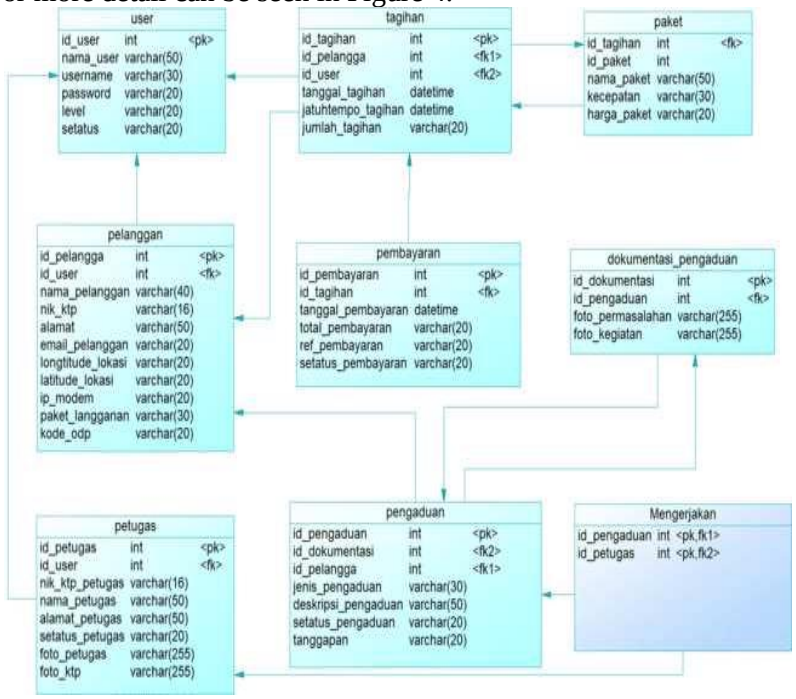

Fig.4. Physical Data Model

4. Results and Discussions

In Figure 5 is a logging page designed for admins and supervisors to log in and get access rights in the service system. This page can be accessed by admins and supervisors.

Fig.5. Admin Login Page

Figure 6 is a dashboard page or main menu on the admin and supervisor view. This page displays customer complaint information, total customer data, total bills, the number of customers who have paid and the number of customers who have not paid. This page can be accessed by admin and supervisor

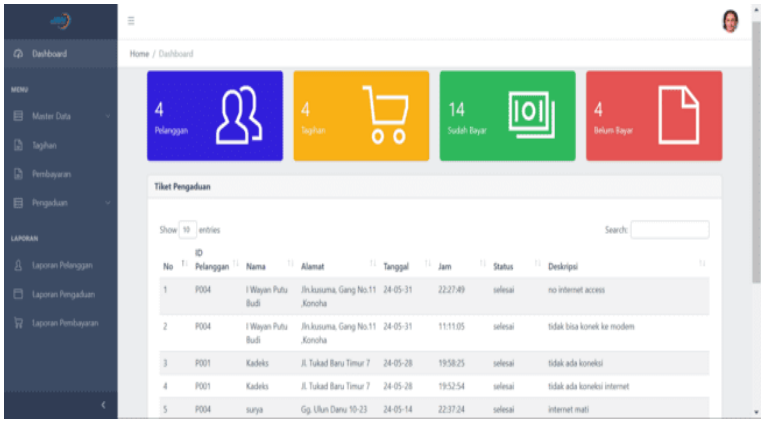

Fig.6. Dashboard Page

Figure 7 is the main page of the user / customer has successfully logged in using the username and password that has been registered on this main page will display several menus for users / customers, namely the payment bill menu, proof of payment menu and complaint menu.

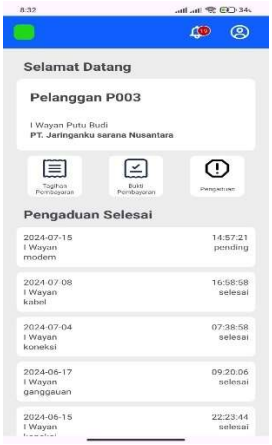

Fig.7. Customer Page

Figure 7 is a customer payment bill menu that will display details of customer bill payments every month. This menu can only be accessed by customers. Figure 4.3 is a customer bill detail that contains the payment period, payment due date, customer identity and the total bill that must be paid by the customer.

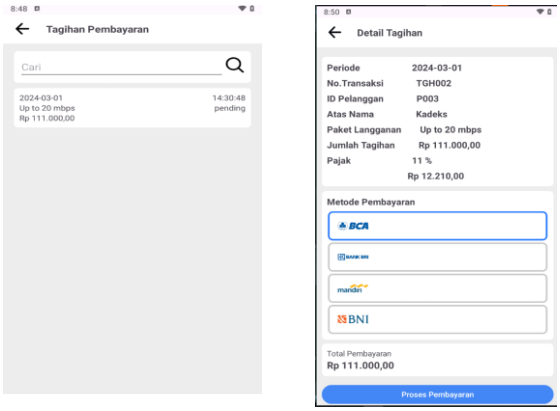

Fig.8. Payment Page Customer

Blackbox Testing

System testing uses blackbox testing to determine the functionality of each system feature is successful and valid to run as expected. there are several blackbox testing scenarios that are applied.

Table 1. Blackbox Testing

No	Skenario	Results	Description
1	System Login	Appropriate	Valid
2	Dashboard Display	Appropriate	Valid
3	Customer Data Display	Appropriate	Valid
4	Payment Display	Appropriate	Valid
5	System Report Display	Appropriate	Valid

Based on 5 scenarios of system testing using blackbox testing, the results show that all system features are appropriate and can be used, so that all features are categorized as valid.

5. Conclusion

Implementation of the Service Information System at PT Jaringanku Sarana Nusantara can solve problems in payment and complaint services. The following is an explanation of how the system can be a solution to overcome these problems: 1) Automatic Service Disconnection and Reconnection: The system will automate the process of disconnecting internet connections for customers who are past due for payment. This is expected to reduce the risk of bandwidth cost losses and better maintain the company's cash flow. Once payment is received, the connection will be automatically reactivated. 2) Centralized Complaint Management: With the implementation of web and Android applications, the system enables centralized management of customer complaints. Customer data and officer tasks will not be scattered, avoiding confusion and improving efficiency in responding to complaints. 3) The results of testing the Service Information System at PT Jaringanku Sarana Nusantara by utilizing blackbox testing, that there are no bugs in the system and the overall functional system functions properly as expected.

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