Research Article

Design of the Web-Based Air Conditioning Service Information System

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Abstract

PT. Marver Maju Sejahtera is a firm engaged in consulting services and AC service services. The current AC service system is ineffective when a customer comes directly to the office to request AC service, which takes quite a long time, so there is a lack of customer interest then the recording of service data still uses paper or handwritten, causing problems such as errors in recording address data or customer residence locations. In that condition, the running system can understand the constraints or problems and be able to provide the right solution. A service information system is a web-based application that makes it easy for customers and the firm to carry out activities. The system development model used is rapid application development (RAD), which is an iterative method, so the design process is carried out according to the developer's version. The result of this system is that it can process information related to AC service services, such as managing customer data, category data, service type data, report data, and service payment transaction processing.

Keywords: Consulting Services System; RAD; Marver Maju Sejahtera

Abstrak

PT. Marver Maju Sejahtera ialah perusahaan bergerak dalam bidang Jasa Konsultan dan Jasa Service AC. Sistem pelayanan jasa servis AC saat ini kurang efektif dimana seorang pelanggan datang langsung ke kantor untuk permintaan servis AC yang makan waktu cukup lama, dengan begitu kurangnya minat pelanggan, berikutnya pencatatan data servis masih menggunakan kertas atau tulis tangan sehingga menimbulkan permasalahan seperti kesalahan pencatatan data alamat atau lokasi tinggal pelanggan. Untuk sistem yang berlangsung agar dapat memahami kendala atau permasalahan dan dapat memberikan solusi yang tepat. Sistem informasi jasa servis AC merupakan suatu aplikasi berbasis web, yang memberikan kemudahan untuk pelanggan dan pihak perusahaan dalam melakukan kegiatan. Model sistem pengembang yang digunakan Rapid Application Development (RAD) yang Merupakan salah satu metode berulang, sehingga proses desain dilakukan sesuai versi developer. Hasil sistem ini ialah bisa memproses informasi berkaitan dengan jasa servis AC, seperti: mengelola data pelanggan, data kategori, data jenis jasa, data laporan, proses transaksi pembayaran servis.

Kata Kunci: Sistem Konsultasi Servis; RAD; Marver Maju Sejahtera

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1. Introduction

Information system design is an important part of integrating processed data into a useful information system for the firm (Rahayu et al., 2019). An air conditioner (AC) is one tool for cooling a room, be it at home, office, or other buildings. Air conditioner users are now mushrooming in almost every place, including housing and even villages, although some people are already using them (Ameriza & Kurniadi, 2021).

The work process is running at PT. Marves Maju Sejahtera is still manual. With this manual system, PT. Marves Maju Sejahtera causes problems such as customers coming directly to the office for AC service requests, which will take a long time. Data recording using handwriting, so errors often occur, such as recording service data, service addresses or locations, report data, lack of data storage security so that data loss often occurs, and the slow development of the firm because only the people around the firm know about the existence of AC service services. Therefore, it is necessary to build a web-based AC service information system that can be accessed anywhere, anytime, so that customers do not need to come directly to the office; as a service solution to satisfy customers and make it easier for employees to make reports such as service data, customer data, the existence of a data security system, and increasing firm development. The firm stores, retrieves, and manages information systems consisting of various people, technologies, Software, internet networks, data sources, rules, and procedures that collect and disseminate information within an organization. (Mie, 2021).

The author contrasts the work done at PT. Marves Maju Sejahtera, with other studies, discussed the same case and provided the same answer. Only the application of the proposed system development methodology is different. The authors draw conclusions based on relevant research snippets, showing how important it is to offer web-based services to improve business performance within organizations.

2. Literature Review

a. Software

Software is a program that includes a set of instructions or commands to process data. The Software serves as a mediator between the user, in this case, the human, and the physical component (Gede Endra Bratha, 2022).

b. Visual Studio Code

Microsoft created Visual Studio Code (VS Code), a fast and efficient text editor for Linux, Mac, and Windows versions of multiplatform operating systems. This text editor supports a variety of other programming languages (including C++, C#, Python, Go, Java, etc.) through plug-ins that can be obtained from the Visual market, in addition to supporting JavaScript, TypeScript, and Node.js. CodeStudio (A. Yudi Permana, 2019).

c. XAMPP

XAMPP stands for X (four operating systems), Apache, MySQL, PHP, and Perl. The localhost web server can be used offline, and users can manage the database through XAMPP located on the localhost without the need for an internet connection, so users can still manage the database (Lumingkewas et al., 2019).

d. PHP (Personal Home Page)

When PHP was first created in 1995 by Rasmus Lerdorf, it was still known as Format Interpreted (FI) and was intended to be used as a script to process data from online forms. As a result, PHP was initially only used to track the number of visits to the home page (Purnama, 2019). PHP, or Personal Home Page for short, is an open-source programming language integrated into HTML for server-side execution. Thus, the PHP source code can be freely distributed and modified (Lumingkewas et al., 2019). Native programming is pure PHP that is compiled, coded, and without the use of additional words for different settings or configurations, created by the programmers themselves. On top of PHP, PHP Native is a collection of web programming languages that allow text-based embedding of Javascript, CSS, Bootstrap, and other languages (Pasaribu & Susanti, 2021).

e. Bootstrap

Bootstrap is an open framework that makes it easy to create websites. It features a variety of responsive HTML and CSS-based templates (Pinatih, 2022). Mark Otto and Jacob Thornton created the CSS framework in 2010, and it can be used to simplify web pages (Purnama, 2019).

f. Google Chrome

Like Firefox, Opera, or Microsoft Edge, Google Chrome is a browser program used to browse the internet. Mozilla

manufactures Firefox, while Google, the world's largest internet firm and owner of Android, compiled and developed Google Chrome (Abdulghani & Gozali, 2020).

3. Methods

The research method describes data to facilitate the work process and produce good results. The research data is carried out to achieve the desired goals (Wardhana, 2023). In this study, the data collection techniques in this research are:

a. Observation

The author made direct observations at PT. Marves Maju Sejahtera, starting from the admin's acceptance of clients who come directly or call in orders and continues until the technician performs air conditioning service at the customer's home or workplace until the completion of this stage, serves as the basis for collecting data.

b. Interview

The author interviewed a firm director named Mr. Felix Peni, S.T. I can ask who is involved in the firm's workflow and how it works.

c. Library Research

This literature study strategy requires reviewing references from books, papers, and past research related to the author's research.

3.1. System Development Model

The Rapid Application Development (RAD) model is a linear sequential approach to developing Software that places a strong emphasis on a short development cycle of about 60-90 days (Pricillia & Zulfachmi, 2021).

Source: (Lumingkewas et al., 2019).

Figure 1. System development with the RAD model

In the RAD model, there are phases of system requirements design where users participate in designing requirements consisting of an analysis of the needs of the system, such as the author conducting observations, direct interviews, and then RAD design workshops where UML design includes (use case diagrams, Activity diagrams, entity relationship diagrams, and user interface diagrams can involve all users, then the implementation of program creation based on design pre-built systems, can be completed, tested and known by the user (Lumingkewas et al., 2019).

Based on the analysis of website creation, several problems justify the change from a manual service ordering system to an online or web-based system. Firm support these changes, some software and hardware are required.

3.1. Web Needs Analysis

a. Hardware

In the context of data processing, hardware refers to equipment that can be viewed directly and used to collect, enter, analyze, store, and disseminate data. Hardware components are divided into several groups based on how they perform different functions (Nadya Dwinna Putri et al., 2022). One of them is a laptop used as a tool to support the design of web-based applications.

Table 1. Laptop Specifications

No	Hardware	Description
1	Laptop	ASUS
2	Processor	Intel (R) Core (TM) i5
3	Memory	8.00 GB
4	HDD	466 GB
5	Screen	Intel (R) HD Graphics Family 60HZ

Table 1. Defining the specification of laptops that support the design of Web-based AC service information systems, Asus laptops with type processors intel (R) core (TM) i5, memory 8.00 GB, HDD 466 GB, and intel (R) HD Graphics Family 60HZ screen.

4. Results

4.1. Database Design

In a computer system, a database is a collection of data or information that can then be processed and expressed using the SQL (Database Management System) application language. MySQL is one of the most well-known DBMS programs. (Purnama, 2019).

a.   Entity Relationship Diagram (ERD)

ERD is an ideal data model that sees and represents the real world as objects and relationships so that the basic function of ERD is used in real life to represent or depict data objects (Anisah Mohd Saad & Muniandi, 2020). Figure 1 illustrates the form ERD uses.
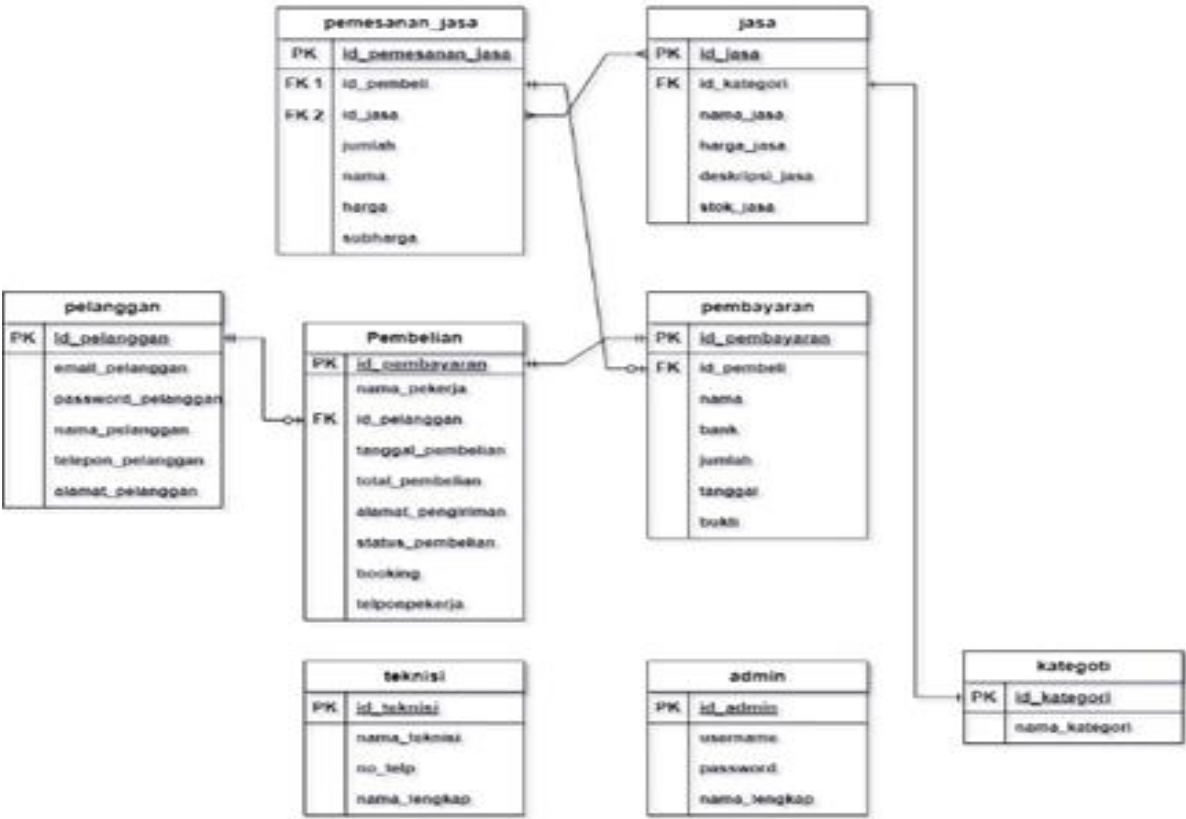

Figure 2. Entity Relationship Diagram

b.   Logical Record Structure (LRS)

The LRS system model or approach describes a database as a connection between tables created from the internal level or properties of a physical entity. Figure 3 shows the LRS used in the design of the information system.
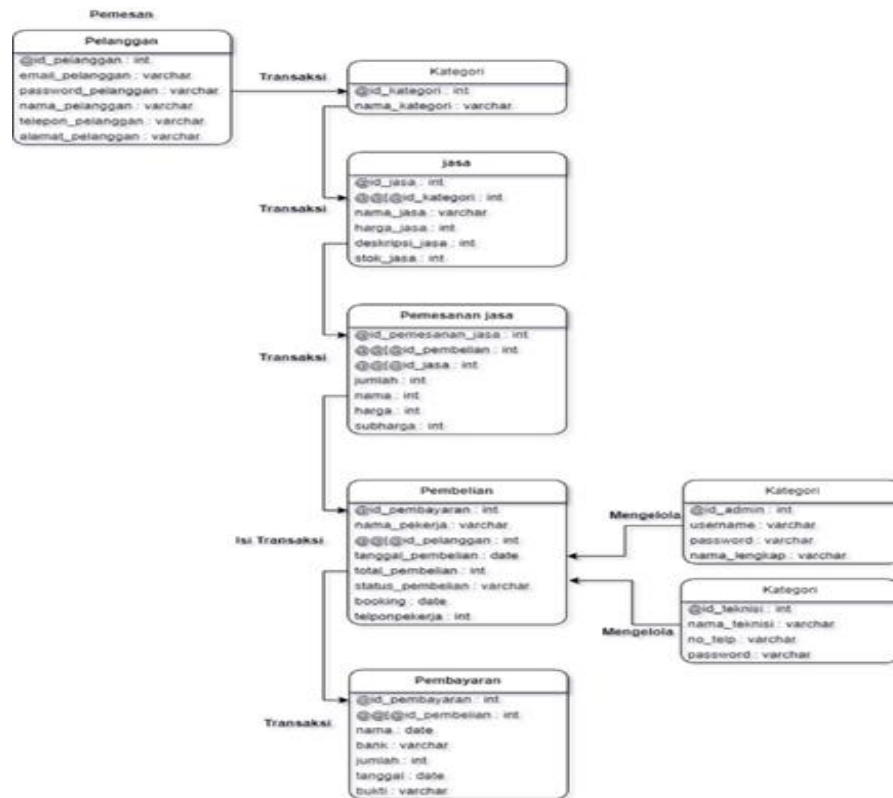
Figure 3. Logical record structure booking service system

4.2. Design System
System design entails developing a framework for a system application and then using it to create or test programs. It also entails defining the procedures and data that the system needs (Wardhana, 2023). In accordance with the system created, the author will discuss the system's design in relation to use case diagrams and activity diagrams.

a.   Use Case diagram
Use case diagrams are features of the system that relate to system users; they show what the system and its components do rather than how they interact (Utama S and Sari, 2021). To make it easier to understand the equipment system, it is illustrated in the form of a use case diagram in Figure 5.
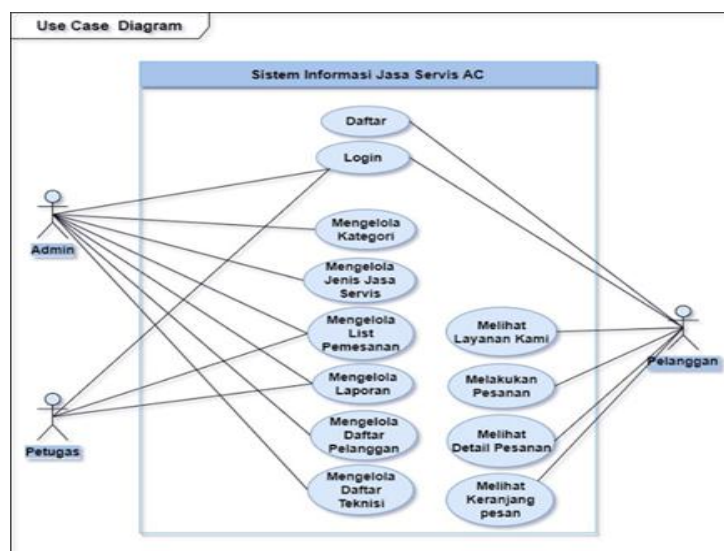

Figure 5. Use Case Diagram of MMS AC Services.

Figure 5. Illustrates the use case diagram of the MMS service ordering information system where each actor has their own functional functions that can only be accessed by the actors themselves. They cannot access each other.

b.   Activity Diagram

This diagram will be used to illustrate the work path in the system, which starts from the business level value to the operational level. Basically, the activity diagram plays a role like a flowchart; the difference with the flowchart is that the activity diagram supports parallel behavior while the flowchart cannot (Ardiati Utama S. Riri Fitri Sari, 2021). To make it easier to understand the system requirements by describing the action diagram as follows:

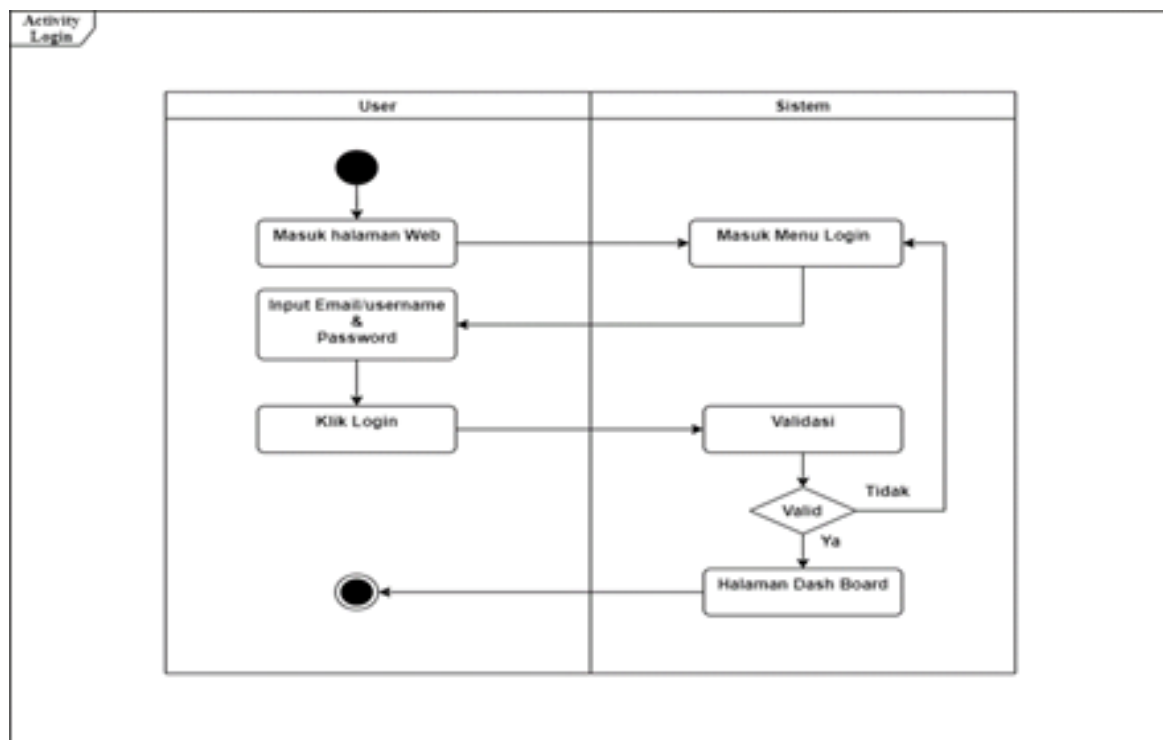1).   *Activity Diagram Login user*

Figure 6. Activity diagram Login Customer/Officer/Admin

Figure 6 illustrates the activity when an actor logs into the system to access each of its functions. Use renter the system Web page to display the login page; the user imports the user name and password, the user clicks the login button, then the system will validate if the data is so, then the system displays the login page again, but if it is true, then it will be a dashboard page.

2).   *Activity diagram service booking*

Figure 7. The diagram illustrates the activity when customers order AC service services into the PT. Marves Maju Sejahtera. When the customer clicks on our service, the system displays all types of services. The customer selects the service that is needed, then the system displays the order data, which is aligned with the service button and enters the customer's address. If the customer clicks the service button, the system will re-display the type of service. If the customer clicks on the customer's address, the system will continue to validate and display the total service cost page. Then, the customer enters the address and clicks Save Data. The system will revalidate if it is true, the system displays the Customer Service Memorandum, and if not, the system returns to the total service payment page to re-enter the customer's address.

Figure 8 illustrates the activity when the admin manages the AC service report. Here, the admin can view the order report and the status of the completed order and then print it into the Web system. Admin starts selecting the report menu, and the system displays the manage report page; the admin imports the start and end dates, then clicks search report, and then the system validates if it does not return to the manage report page. If it is true, the system will display all reports; the admin clicks print, then the system displays the report file and validates; if not, then the system displays the manage report page again; if it is true, then the admin clicks save the finished report.
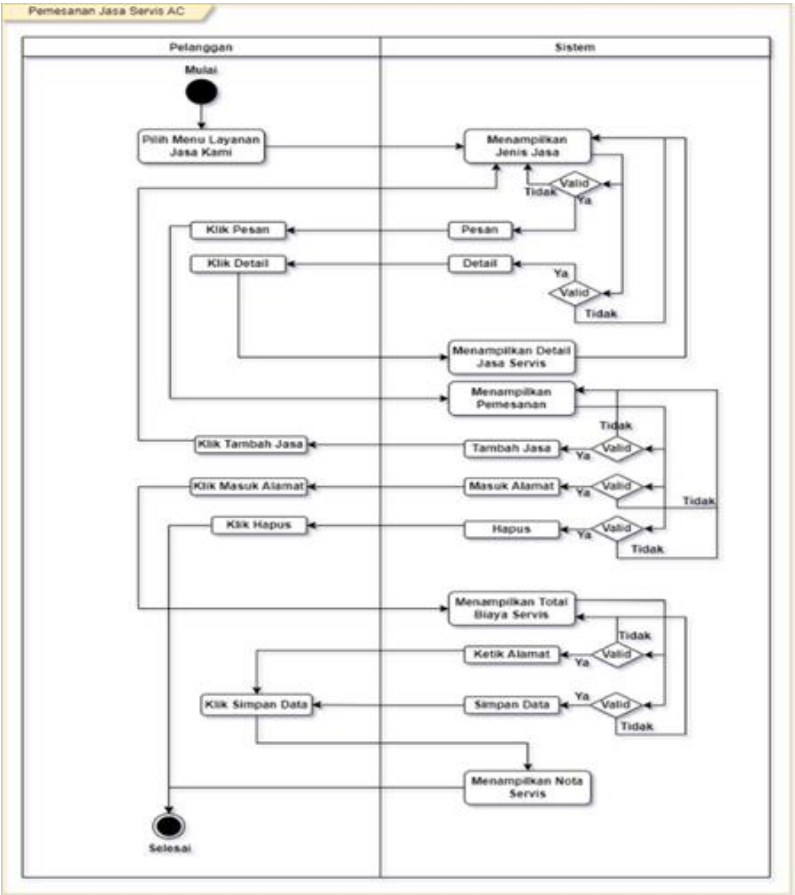
Figure 7. Activity chart manages orders
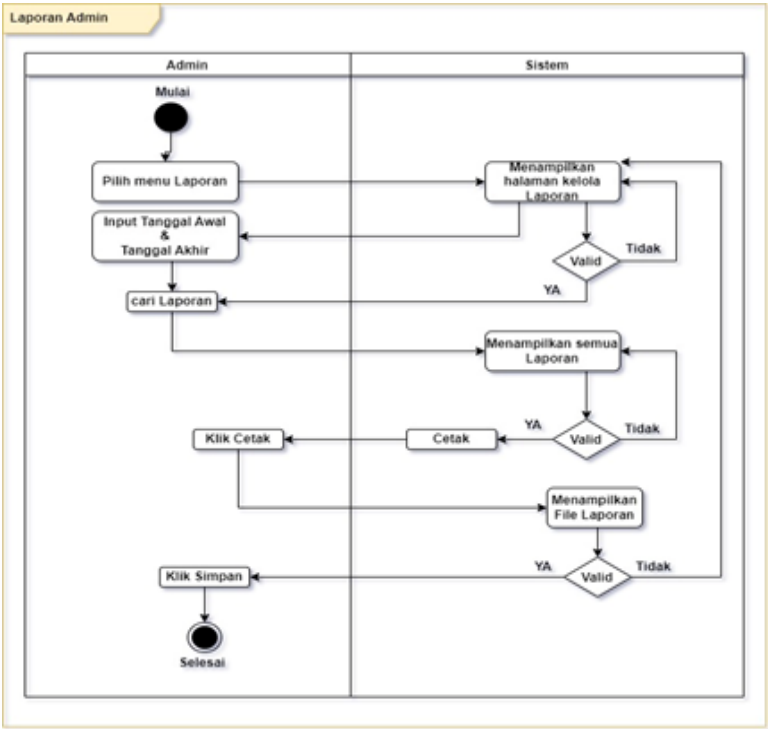
3). *Activity diagram* kelola laporan admin

Figure 8. Activity chart manage admin reports

5. Discussion

When utilizing information systems, a firm tries to facilitate ease of use and convenience. It is very important that the presentation and design are simple enough for users to understand. Here are some of the different characteristics that exist on the internet that make a website interactive for users (technicians, consumers, and administrators) when they access it.

a.   User Home Page Display

Figure 9 is the User Home page, where there is a menu of Our Services, Customer Login, Officer Login, and Customer List.

Figure 9. User Home Page View

b.   View of the customer list page

Figure 10 below is the display of the customer list page where customers can import their name, email, password, address, and phone/cellphone. Then, the customer clicks the save button.

Figure 10 Customer List Page Display

c.   Display of the Customer Service Order Page

Figure 11, this is displays the service type page where customers can see all types of services by clicking the message button to order a service and clicking the detail button to see the description of the service service.

Figure 11. Customer Service Order Page

d. Display of Customer Service Order Form

Figure 12 displays the orderer data. A delete button and Tambah jasa are safe if anyone wants to be added. The customer clicks on the address input, which displays the total service cost. The customer enters the address and then clicks Save Data.

Figure 12. Customer Order Data Form Display

e. Admin dashboard page view

Figure 13 is the view of the Admin dahsboard page.

Figure 13. View the Admin dashboard page

f. Admin Reports page view

Figure 14 is the view of the manage report page by the admin. Where the admin enters the start and end dates, then clicks search report, and if all the report data appears, the admin can click the print button.

Figure 14. Report page view

6. Conclusion

Customers and staff at PT. Marves Maju Sejahtera can obtain information on ordering air conditioning service services and manage firm data more easily by using this website. Customer data processing in a service information system is an orderly and structured web-based computerized application. This web-based

information system is to reduce customer difficulties because it uses a relatively easy and simple information system in accordance with current technological developments when compared to the manual process where customers come directly to the office and employees have difficulty in making service reports. Service information system at PT. Marves Maju Sejahtera can expand the firm's reach so that the firm's progress can develop and be more advanced.

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