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Point of Sales (POS) System Design using Design Thinking Framework for Motorcycle Workshop

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Abstract

The challenge of MSME business is the change of transaction systems from conventional to digital processes to minimize human error. This research offers an idea to identify problems, classify digital innovation ideas, analyze needs, and design management information systems Point of Sales (POS) modules in CV. Renaldi Motor. The method used in designing the management information system of the POS module of the OmO Jaya Workshop application is design thinking. The stages in this research consist of empathizing, defining, ideating, prototyping, and testing. The results of this study show that the problem faced by Micro, Small, and Medium Enterprises (MSMEs) workshop businesses is the process of recording transactions that still use conventional methods. Through the digital innovation of the POS module management information system in the form of the OmO Jaya workshop application. Through the application, a CV. Renaldi Motor is expected to optimize the digital transaction recording system and improve business performance. Thus, the risk of business losses due to human error can be minimized. In addition, the Blackbox test results show that the test results in each process have been successful and as expected. This study concluded that the Point of Sales (POS) System can improve CV. Renaldi Motor's business performance through digitizing the sales transaction recording process.

Keywords: POS, System Design, Design Thinking, Motorcycle Workshop

1. INTRODUCTION

The traditional or manual recording of transactions is one of the barriers that Micro, Small, and Medium Enterprises (MSMEs) face while buying and selling. This catalyzes for developers to create information systems that aid in the flow of online commercial transactions. In [1] demonstrates that the challenge for MSMEs in operating their businesses and innovating is the need for more human and financial resources connected to utilizing technology to streamline recording sales

transactions. On the other hand, [2] shows how technology innovation in the transaction process not only achieves effectiveness in the transaction recording process but also offers a convenient shopping experience in terms of the length of time or time of product purchase. This demonstrates that MSMEs must change to keep up with technological advancements to enhance business operations and ensure business continuity. Therefore, creating a Point of Sales (POS) system that supports MSME business performance is essential.

A safe application of digital technology can help to stabilize the economy and increase community security through thriving businesses. In the MSME context, digital technology is essential for product and service management and daily business operations. [3] demonstrates how POS system design can improve MSME firm operations regarding product and service management. Instead, [4] indicates that employing digital technology for information system-based transaction management presents a problem for MSME company operators. This illustrates how having the knowledge or skills to use the proper digital technology can promote business process optimization. Therefore, performing a thorough analysis of the issues and requirements associated with employing POS information systems to record sales transactions in MSME enterprises is vital.

Based on case studies from the CV. Renaldi Motor, this study offers suggestions for examining the applicability of POS information systems. When selecting an MSME company for the CV, Renaldi Motor should take the following factors into account: First, manually documenting transactions still has the potential to result in mistakes owing to carelessness or errors in capturing transaction data; second, traditional paper-based documentation methods have the potential to result in losses due to failure to store important files or documents; Thirdly, each actor's basic tasks must be understood in light of the obligations that follow the availability of human resources or personnel. Based on these factors, CV. Renaldi Motor's MSME workshop business was designed to focus on business actors' and employees' issues and requirements.

A challenge in the age of the industrial revolution is adjusting to the technologies employed to support the sustainability of MSME businesses. 4.0. [5] demonstrates that MSME firms are still dominant in using digital technology for product and service marketing activities instead of streamlining operational business management or recording transactions. Instead, [6] demonstrates how technology is utilized to improve the performance of MSME businesses over time by optimizing various business operations. This demonstrates how digital technology in business process innovation enhances the marketing of goods and services and increases the efficiency and effectiveness of corporate functions. The POS system must be optimized to promote innovation, improve business performance, and ensure the long-term viability of MSME businesses.

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The workshop business is one sort of Micro and Small Enterprise (MSE) that can mobilize community access to maintain sustainable livelihoods. Nevertheless, [7] demonstrates many workshop firms' continued use of traditional financial recording techniques. Instead, [8] reflects the necessity to expand the use of technology in efforts to promote services through social media. [9] proves a massive need for workshop business services. Therefore, it must be controlled effectively by developing business processes and website- and mobile-based digital transactions. This suggests that a digital technology needed by workshop business actors is connected to the POS system. In light of this, the Design Thinking framework was used in this project's design of the POS management information system, which was implemented through a case study at CV. Renaldi Motor Workshop.

Research has already been done on the design of information systems for workshop business management. [10] is designing a web-based POS module management information system to overcome the problem of transaction data loss faced by MSME workshop business actors. On the other hand, studies related to workshop business are associated with the design of Enterprise Resource Planning (ERP)-based POS modules [11] and workshop inventory information system based on Economic Order Quantity (EOQ) and ReOrder Point (ROP) [12]. This shows that the design of a web-based POS module management information system for a workshop business needs to be studied contextually based on the characteristics of the workshop business. Thus, the output of this research can describe and analyze the results identified and classify problems. User needs comprehensively as well as the context of MSME businesses in CV. Renaldi Motor workshops using the Design Thinking framework.

2. METHODS

This study applies design thinking to pinpoint issues, organize creative suggestions for streamlining business processes, and assess the demands of POS module management information system users in the setting of Renaldi Motor workshops. The design thinking framework has the following stages: Empathize, define, ideate, prototype, test, and test. The defined stage involves prioritizing issues and conditions and identifying the problems and needs of business actors. The test stage consists of testing the POS system. The ideate stage involves networking creative ideas for business process optimization relevant to the context of the Renaldi Workshop. Figure 1 below summarizes the design thinking framework used in this study.

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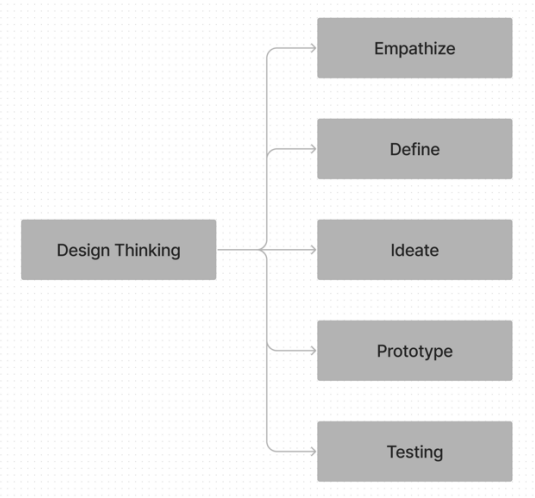

Figure 1. Design Thinking Framework

Figure 1 shows each stage in designing a POS system for MSMEs in the CV—Renaldi Motor workshop business. The following difficulties are revealed while assessing the issues and needs of business players connected to documenting transactions (cashiers). First, it risks losses by continuing to record transactions using traditional or manual methods. Thirdly, papers or transaction data are lost; secondly, conventional processes could be more successful in terms of service process completion time when there are many client lines; and thirdly, managing or overseeing employee performance is rendered useless. This demonstrates the requirement for a digital system in CV. Renaldi Motor maximizes the recording of digital transactions. Additionally, a more effective and efficient employee performance control system can help business performance regarding digital innovation based on POS modules.

At the defined stage, identifying issues and categorizing system user demands must be prioritized. The priority concern is recording transactions based on employee and customer identities to assess recipients and service providers. Website-based information systems accessible to business owners, government officials, and employees are in high demand. Systems for point-of-sale management are solely intended to be operationalized internally to satisfy management or operational business demands.

Networking novel ideas pertinent to the Renaldi Motor Workshop business process is done at the idea stage. The POS module management information system is built on a website based on user problems and wants. It is compatible with devices owned by Renaldi Motor Workshop and is easily accessible. The actors accessing the POS module management information system at Renaldi

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Motor Workshop are separated into three groups based on the system user experience: business owners, casters, and employees. Owners of businesses have access to all management and employee performance tracking tools. The case, however, is restricted to handling transaction data, specifically adding, grouping, updating, and removing data (through verification). The number of services offered to clients by day, month, and year and the number of personnel with access to personal data information.

Creating the website-based POS module management information system is carried out by the number of actors using the system during the prototype stage. The User Experience (UX) law is adjusted by the application interface design, and then a Use Case diagram is used to show how the system works. The following supporting programs were utilized in the prototype: first, Figma was used for interface design; second, Star UML was used for use case diagram creation; and third, the bootstrap template was used for actualizing the prototype. System trials can be conducted to determine system user perceptions connected to the features and functions of the POS module management information system based on the outcomes of the prototype design. Actors in the Use Case Diagram are intended to be restricted to admins and super admins when creating POS system prototypes. In addition to creating and updating transaction histories, the admin can log in, read, and change product inventories. Super admins can establish and delete admin accounts and add and remove items from the list.

The management information system for the POS module was assessed during the testing phase, and a trial was held at the Renaldi Motor workshop. The following features and capabilities are considered: first, the process of testing user and admin logins; second, the process of data addition; third, the process of pushing data updates; and fourth, the process of data deletion. Following trials, results that fell short of user expectations are assessed, and plans are made for application development programs to address user needs and offer fresh experiences to all system users.

3. RESULTS AND DISCUSSION

The capacity to support the technology infrastructure used by business units and the ability to acquire financial capital to buy various technology devices to support business operations provide challenges when trying to innovate company processes from traditional to digital techniques. [13] shows that digital technology optimization for sales transaction recording information systems can improve business competitiveness and performance. As opposed to that, [14] suggests that the innovation of workshop business processes using digital transaction recording applications can be adapted to various concepts such as Point of Sales (POS) and Enterprise Resource Planning (ERP). This research offers the idea of adopting POS modules in information system design relevant to the case study in CV.

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Renaldi Motor. Conventional transaction recording may result in losses from employee negligence based on determining user demands; as a result, a POS module management information system is built, as indicated in the use case diagram in Figure 2 below.

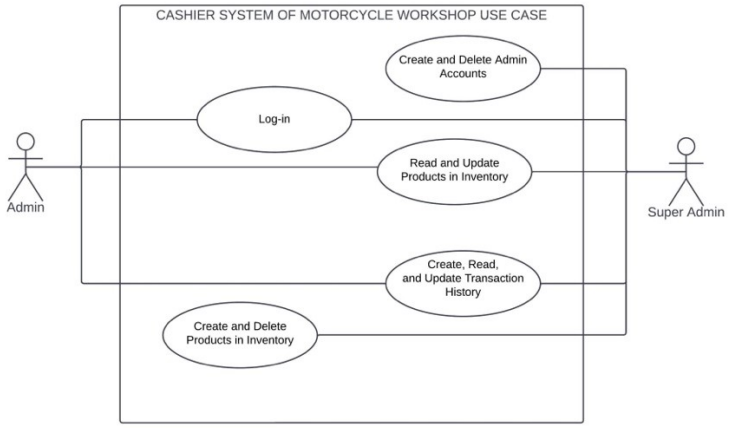

Figure 2. Use Case Diagram

Figure 2 is a use case diagram based on each design thinking framework stage. The possibility of document loss owing to conventional procedures is the primary issue in the transaction recording process. Additionally, because customer data is still recorded manually, CV. Renaldi Motor business owners want assistance in correctly processing customer data for marketing purposes. Considering this, digital data is essential for processing client data for marketing products and services at CV. Renaldi Motor. Based on these considerations, a selection process is carried out at the defined stage and identifies challenges and user needs based on a priority scale. The result of the selection and classification of prioritized issues is the innovation of conventional transaction recording into digital, which needs to be accommodated by utilizing the POS module management information system.

Innovative ideas are filtered at the concept stage according to the importance of system users in the CV. The necessity for management and oversight of transaction data controlled by employees serving as admins may be seen at Renaldi Motor Workshop. Additionally, it calls for a single system user to have the power to create or delete that admin account. While the admin can be used by personnel working as casters at CV, super admin is an account that business owners can only use. Motor Workshop Renaldi. Administrators have access to and control over product data. Additionally, admins can view, add, and update transaction data. Figure 3 below summarizes the POS management information system database

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for the CV. Renaldi Motor. Super admins can create manager accounts and amend inventory product data.

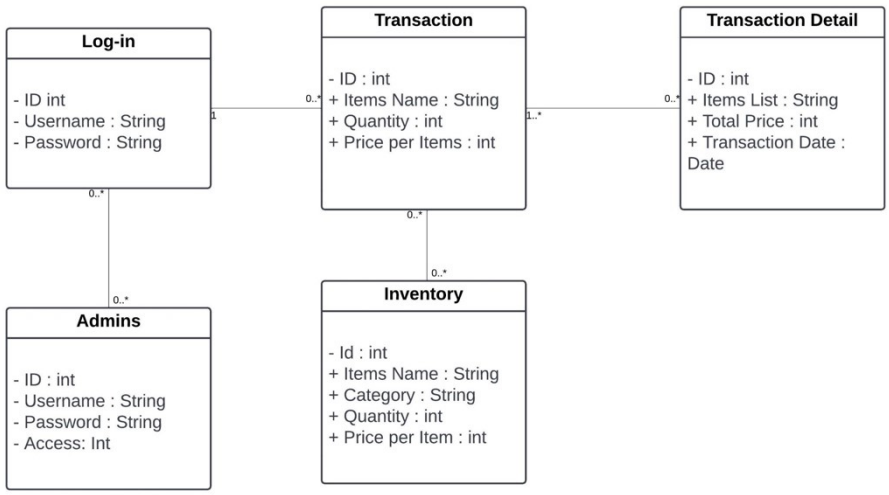

Figure 3. Class Diagram

Figure 3 is a database diagram in the POS module management information system designed according to the needs of the CV. Renaldi Motor Workshop. The databases in CV. Renaldi Motor Workshop's POS management information system is categorized as follows: First, a login that keeps usernames and passwords with string data types; second, admins that keep access data, usernames, and passwords to distinguish between admins and super admins; third, transactions that store data related to items names with string data types, quantity with integer data types, and item price with integer data types; fourth, transaction details that store item list data with string data types, total price data with integer data types, and transaction data; and finally, a login that keeps usernames and passwords with string data; Fifth, inventory that is linked to transaction data, where the names of the goods are of the string data type and the categories, quantities, and prices are all of the integer data types—the POS module management information system for CV. Renaldi Motor is prioritized, as evidenced by a strong emphasis on inventive transaction recording. The interface design's outcomes as a working prototype of the POS module management information system correspond to the demands of the CV managers.

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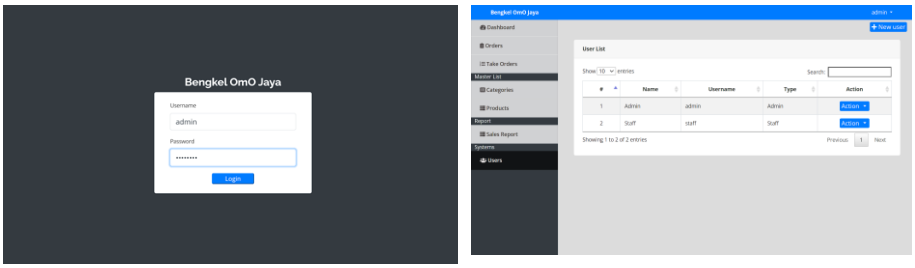

Figure 4. User Interface Login and User Page

The interface design of the user page and login page for CV. Renaldi Motor Workshop's POS module management information system is shown in Figure 4. It is recognized that system users may be subject to limits following the consideration or policy of the business owner based on the findings of user classification based on the operational authority of the application. The order data, take orders, master list (categories and products), report (sales report), and system are crucial elements of the POS module management information system for CV. Renaldi Motor Workshop (users). The primary dashboard can show graphs showing the number of products sold and the number of products available in retailers. Users can use navigators to speed up data searching and filtering to evaluate product data by day, month, and year. As admins and super admins, users can access product data and transaction history to better manage and oversee employee performance at CV. Renaldi Motor Workshop. Figure 5 below illustrates one method of monitoring the data entry process in this application.

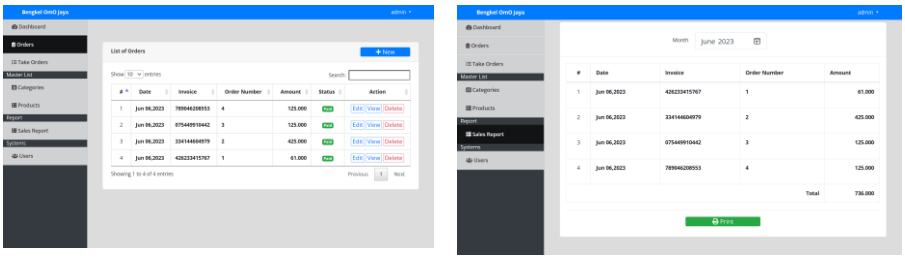

Figure 5. User Interface Order Page and Sales Report

The interface design for order pages and sales reports is shown in Figure 5. All order amounts and status information is displayed on the order page based on the transaction date and invoice number. Administrators can view, edit, and delete data. Additionally, it can be seen that information about the transaction date, invoice number, order total, and income in rupiah can be printed for the convenience of business owners on the sales report page. Analyzing transaction data allows for monthly and yearly employee and company performance

evaluation. The availability of vehicle parts for purchase in the workshop, the volume of repair service requests, and the ability of personnel to perform services to customers daily can all be known thanks to the OmO Jaya workshop application. As a result, this approach can improve corporate effectiveness and efficiency over time. The following table shows the outcomes of the application performance testing.

Table 1. Login Test Results

No	Test Scenarios	Test Cases	Expected results	Results
1	Clear all login data fields and press the login button	Username (blank) Password (blank)	The system denies login access and displays a message: please enter your username and password!	Succeed
2	Fill in the wrong username and correct password then press the login button	Username (incorrect) Password (correct)	The system denies login access and displays the message: Your username is wrong!	Succeed
3	Fill in the correct username and wrong password then press the login button	Username (correct) Password (incorrect)	The system denies login access and displays the message: Your password is wrong!	Succeed
4	Fill in the appropriate username and password then press the login button	Username (correct) Password (correct)	The system receives login access then redirects to the dashboard	Succeed

Table 1 is the results of black box testing, where the testing process is carried out based on the specified scenario; for the login process, there are several testing processes as follows: first, empty all login data fields, then press the login button in the hope that the system denies login access and displays a message (please enter your username and password!); second, fill in the wrong username and correct password and then press the login button in the hope that the system denies login access and displays a message (your username is incorrect!); third, fill in the correct username and incorrect password and then press the login button, in the hope that the system denies login access and displays a message (your password is wrong); Fourth, fill in the appropriate username and password and then press the login button, in the hope that the system receives a login to access and is then redirected

to the dashboard. Based on the test results of the login process, the test results are successful and match the expected results.

Table 2. Testing Results of the Data Addition Process

No	Test Scenarios	Test Cases	Expected results	Results
1	Clear all data and press the save button on each page	Orders page, Master List page.	The system refuses and displays a message: please input data first!	Succeed
2	Clear one of the forms and then press the save button	Orders page, Master List page.	The system refuses and displays a message: please complete the data !	Succeed
3	Fill in the complete data and press the save button	Orders page, Master List page.	The system saves the data and displays the message: The data was saved successfully!	Succeed

Table 2 is the test result of the process of adding data on the orders page and master list page, where each piece of data is tested in the following ways: first, empty as you want the data, and then press the save button on each order page and the master list, in the hope that the system rejects and displays a message (please input data first!); second, clear one of the data forms and then press the save button on the orders page and master list page in the hope that the system rejects and displays a message (please complete the data); Third, fill in the complete data and press the Save button on all Orders pages and Master List pages, hoping that the system saves the data and displays a message (the data was successfully saved!). Based on the entire process of adding data testing, it can be seen that all test results are successful and as expected. Furthermore, viewing, updating, saving, and deleting data can be tested.

Table 3. Test Results of the View, Update, Save, and Delete Data Process.

No	Test Scenarios	Test Cases	Expected results	Results
1	Pressing the view button	Orders page, Master List page.	The system is redirected to transaction data details	Succeed
	Press the edit button	Orders page, Master List page.	The system is redirected to the transaction detail page so that data can be updated	Succeed

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No	Test Scenarios	Test Cases	Expected results	Results
2	Press the print button	Sales Report page	The system displays the transaction history data and displays the message: the data was successfully downloaded!	Succeed
3	Press the delete button	Orders page, Master List page, Users page.	The system displays the message "Are you sure you want to delete this data?" If yes, then the data is deleted, otherwise the system will redirect to the previous page.	Succeed

Table 3 is the test result of viewing, updating, saving, and deleting data on the orders page, master list page, users page, and sales report page. This test focuses on the view, edit, print, and delete buttons. If the view button is clicked, the system is redirected to the transaction data details; if the edit button is clicked, the system is redirected to the transaction detail page to update data. If the print button on the sales report page clicks, the system will display transaction history data and a message that the data has been successfully downloaded. If the delete button clicks, the system will display a message (are you sure you want to delete this data?). If yes, the data will be deleted; the system will be redirected to the previous page. Based on the entire testing process, the test results were successful and as expected.

4. CONCLUSION

This study concluded that the Point of Sales (POS) System can improve CV. Renaldi Motor's business performance through digitizing the sales transaction recording process. The POS module management system is handy for MSME business actors in optimizing business processes through digitizing workshop business transaction processes. Based on a case study in CV. Renaldi Motor workshop business owners can utilize a POS system to optimize business processes to minimize the risk of losses caused by employee negligence in the transaction recording process. This shows that potential losses due to human error can be minimized through POS module management information systems. The POS module management information system is designed using a design thinking framework through empathizing, defining, ideating, prototyping, and testing. Based on the results of the application trial, it can be seen that each scenario in the login process, the data add function, the data update process, and the data delete process has met expectations and is following realization. Meanwhile, adding application features

can be planned periodically following the maintenance program to accommodate CV. Renaldi Motor workshop needs and further requirements.

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