

Web-Based Inventory and Sales Information System: Indonesian Micro Small Medium Enterprise Case Study

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Abstract

Information systems have a very important role in increasing productivity values that provide effectiveness and efficiency in the business sector. Cik Cik MSME Meatshop and Frozenfood is still using a manual system for recording their inventory and sales data, which causes several problems such as human error, human fraud, and inaccurate data. To overcome the problems, a solution is provided, that is a web-based information system, focused on the inventory and sales business processes. The information system is designed using Rapid Application Development method. The tools used are XAMPP as a web server and Visual Studio Code as a code editor. The programming language to be used is PHP, CodeIgniter as a framework, and MySQL as a database storage. The results obtained from the development of this information system are this system can help Cik Cik MSME Meatshop and Frozenfood in overcoming problems related to sales and inventory become easier to manage the data so that it is more automated compared to the previous manual system.

Keywords: information system, inventory, msme

Abstrak

Sistem informasi memiliki peran yang sangat penting dalam meningkatkan nilai produktivitas yang memberikan efektivitas dan efisiensi dalam dunia bisnis. Cik Cik UMKM Meatshop dan Frozen food masih menggunakan sistem manual dalam pencatatan persediaan dan data penjualannya. Hal ini menyebabkan beberapa permasalahan seperti human error, human fraud, dan ketidakakuratan data. Untuk mengatasi permasalahan tersebut, maka diberikan solusi berupa sistem informasi berbasis web yang difokuskan pada persediaan dan penjualan Perseroan. Sistem informasi dirancang dengan menggunakan metode Rapid Application Development. Tools yang digunakan adalah XAMPP sebagai web server dan Visual Studio Code sebagai code editor. Bahasa pemrograman yang akan digunakan adalah PHP, CodeIgniter sebagai framework, dan MySQL sebagai basisdata. Hasil yang diperoleh dari pengembangan sistem informasi ini adalah sistem tersebut dapat membantu perusahaan dalam mengatasi permasalahan yang ada. Sistem informasi berbasis web ini memudahkan Perseroan dalam mengelola data terkait persediaan dan penjualannya sehingga lebih otomatis dibandingkan dengan sistem manual sebelumnya.

Keywords: sistem informasi, inventori, umkm

1. INTRODUCTION

Information systems have a very important role in increasing productivity values that provide effectiveness and efficiency in daily human activities in various fields, including the business sector. These activities also include planning and empowering all existing resources within the company [1]. In other words, information systems help businesses manage existing data and information and can provide convenience for users from all departments [2]. Having a good management information system will also be a distinct advantage for the company because it can integrate every component, both information and data, companies can also process information and data between departments more accurately and each department can also access information and data easily and in real-time [3]. Micro, Small, and Medium Enterprises or commonly abbreviated as MSME is one type of productive business that until now has been quite developed in Indonesia. MSMEs are business activities that help the community by increasing employment and playing a role in serving the expanding economy. With the existence of MSMEs, now people's income can be leveled and increased which can encourage and stabilize economic growth in Indonesia [4]. In data from the Central Statistics Agency (Badan Pusat Statistik - BPS) in 2018, MSMEs have contributed to the Gross Domestic Product (GDP) with a percentage of 61.41% with more than 64 million businesses from various sectors, such as agriculture, animal husbandry, processing, trade, services, and communications, and employs approximately 116,978,631 workers [5]. Of course, this contribution continues to increase in tandem due to the opening of new jobs or MSMEs. Based on the data of Ministry of Communication and Informatics, it was also found that only around 8%, or if the total is as many as 3.79 million business actors run their business based on technology. This indicates that not many existing MSMEs carry out their business processes by utilizing information technology [6].

One example of MSMEs, namely Cik Cik Meatshop and Frozen Foods, is a medium-sized business engaged in the field of sales agents for frozen or frozen food ingredients in various categories. These frozen food ingredients include beef, chicken, fish, nuggets, sausages, and meatballs. Apart from frozen food ingredients, Cik Cik Meatshop and Frozen Foods also sells various mushrooms and sauces. This MSME started its career in 2019 from home business and until now has continued to develop into a supplier agent serving purchases from retail customers, hotels, restaurants, and catering (Horeka) through their store at the Deltamas shophouse or even online via Whatsapp or Grab mart with a turnover around 4 billion rupiahs annually. The Company also has a total of 9 employees with 2 heads, 1 warehouse and delivery department, 1 admin and production section, and 5 other employees. Based on the results of interviews with Cik Cik Meatshop owners directly, it is known that in the sales process, Cik Cik Meatshop and Frozen Foods records incoming and outgoing stock data and sales transactions manually, such as inputting the data into Microsoft Excel and handwriting using paper. This certainly can hinder the company in recording data and making reports because it takes a long time and results in frequent human errors and lost data because it is tucked in with other files. Inventory data is also inaccurate due to discrepancies between existing stock and incoming and outgoing stock data resulting from human fraud or forgetting to update.

2. RESEARCH METHOD

2.1. Rapid Application Development (RAD)

The object of this research is an MSME named Cik Cik Meatshop and Frozen Foods. The Company is a medium-sized business that operates as a supplier agent in the field of selling food ingredients, especially frozen food. In this study, Rapid Application Development (RAD) method will be used in future system design. RAD is used because the system is quite simple and small-scale in terms of the needs of the research object, so it doesn't take a long time and the costs incurred are not too large. RAD is one of several software development methods that are classified

as incremental techniques and focus on fast-cycle or relatively short development cycles as shown in figure 1. RAD method is a method that can be used by companies if they want to develop a system or application in a short time [7].

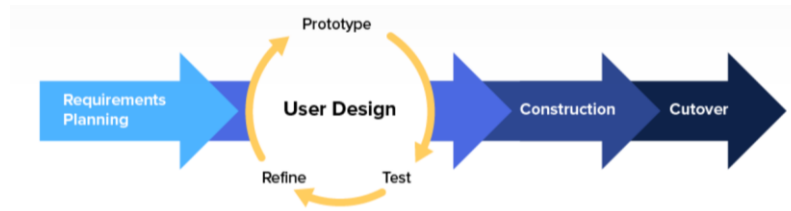


Figure 1. RAD Method Stages [8]

Figure 1 showed that RAD consists of some phases comprised of requirement planning, user design, construction, and cutover. The first phase is requirement planning. Consulting closely with the stakeholders to determine the user requirements for the software application. The next phase is user design cycle. This cycle consists of prototypes, tests, and refinement. At this stage, the system is designed using UML that consists of a use case diagram, activity diagram, and class diagram. Afterward is construction phase. At this stage, HTML is used with CodeIgniter framework, PHP programming language, and MySQL database running with XAMPP. The text editor used is Visual Studio Code. The final phase is cutover. The main objective of this phase is to verify that the program works properly and consistently and complies with the objectives and specifications provided by the stakeholders. The testing will be carried out using the black box testing method which will produce User Acceptance Testing (UAT).

3. RESULT AND DISCUSSION

3.1. Requirement and Planning

In this early stage, an analysis of the business processes of Cik Cik Meatshop and Frozen Foods was carried out to find out the needs and problems that occur in the user requirements. In conducting problem analysis, direct interviews were conducted with the owners of Cik Cik Meatshop and Frozen Foods. From the results of the interviews conducted, it was found that Cik Cik Meatshop and Frozen Foods experienced problems and agree with some proposed solutions as shown in table 1. Table 1 showed various difficulties based on specific indications and problems that identified by applying PIECES analysis [9]. As a result, some main features needed in the system such as manage users, manage customers, manage sales reports, manage stocks, manage sales transaction, and manage customers.

Table 1. PIECES Analysis

PIECES	Current Issues in The Company	Proposed Solution
Performance	The process is still manual and involves some people which can lead to double recording and misinformation	Manage Users: The system Administrator can add or remove users who access the information system.
Information	Existing product stock must be checked and counted in the warehouse	Manage Product: Managing product data, such as adding and editing product data from the system and knowing the product stocks.
Economics	Sales are hard to be increased because lack of Sales Reports. Sales reports are still manual so many records are missing, double records, or damaged.	Manage Reports: Able to export the internal sales report specified period, by pressing the Export button.

PIECES	Current Issues in The Company	Proposed Solution
Control	Manual control by counting and memorizing product categories and measurements, causing the potential for classification errors or wrong information	Manage Product Category: Able to perform adding and editing product category data Manage Product Unit: Able to add and edit product unit data.
Efficiency	Receipt from sales transactions still uses handwritten paper, so it is not efficient in terms of recording costs and time	Manage Sales Transaction: Able to add existing or existing sales transactions by filling in the required fields and pressing the Pay or Pay and Print button to confirm transaction payments.
Service	It cannot be automated yet because it doesn't have a customer database so service to customers can't be done quickly because they still summarize from records.	Manage Customer: Managing customer data, such as adding and editing customer data and collecting data related to their customer information, starting from names, and addresses, to telephone numbers.

3.2. Use Case Diagram

Use case diagram are shown in figure 2. Figure 2 showed that there are three actors, namely system administrator or master admin, admin staff, and cashier. System administrator has access to all the features in the system design. Admin staff have access to almost all features except managing user data, categories, units, and products, sales and user reports, and add transactions. For the cashier, access is limited to managing transactions and reports.

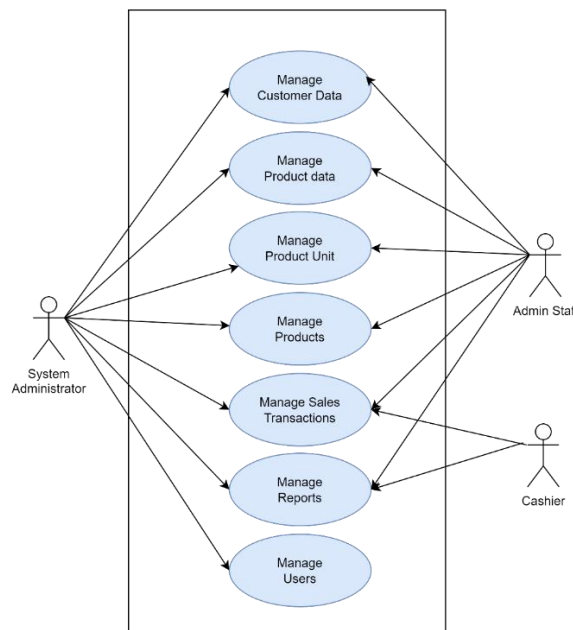


Figure 2. Use Case Diagram

3.3. Activity diagram

Activity diagram shown in figure 3. Figure 3 showed an overview of activities when the cashier wants to input sales transactions. When entering the transaction page, the system will display a sales form. The cashier selects the product and the data entered will be displayed on the sales list. If the list of items sold has been inputted, the user can confirm and a confirmation form will appear containing the customer's name and the amount paid. After the confirmation form is filled in, the user can choose between making a payment directly or making a payment and printing a receipt. If you pay directly, the sales transaction data that has been input will then be

directly stored in the database. If you pay and print a receipt, the user will be taken to a pdf which is a receipt for the transaction and the user can print it. This activity can be done also by master admin dan admin staff.

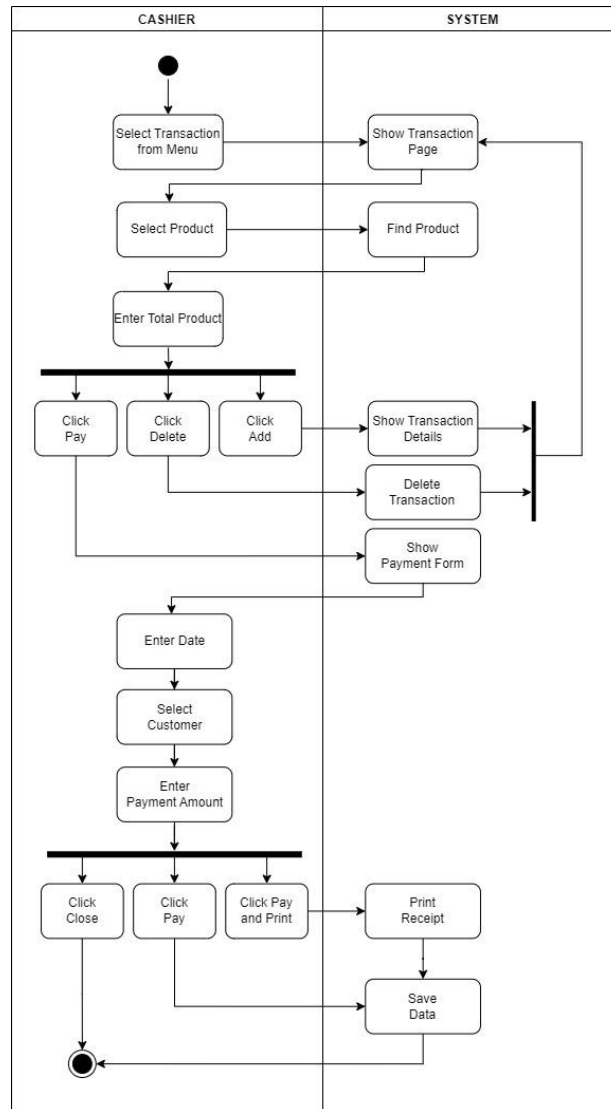


Figure 3. Activity Diagram

3.4. Class Diagram

Figure 4 is an illustration of the proposed class diagram. Based on figure 4 there are 11 classes connected which are users, master admin, admin, cashier, sales, sales detail, product category, product, product unit, customer, and incoming stock. The diagram showed the relationship between classes both association, generalization, and aggregation. Each of these relations also describes the actions that occur in the system.

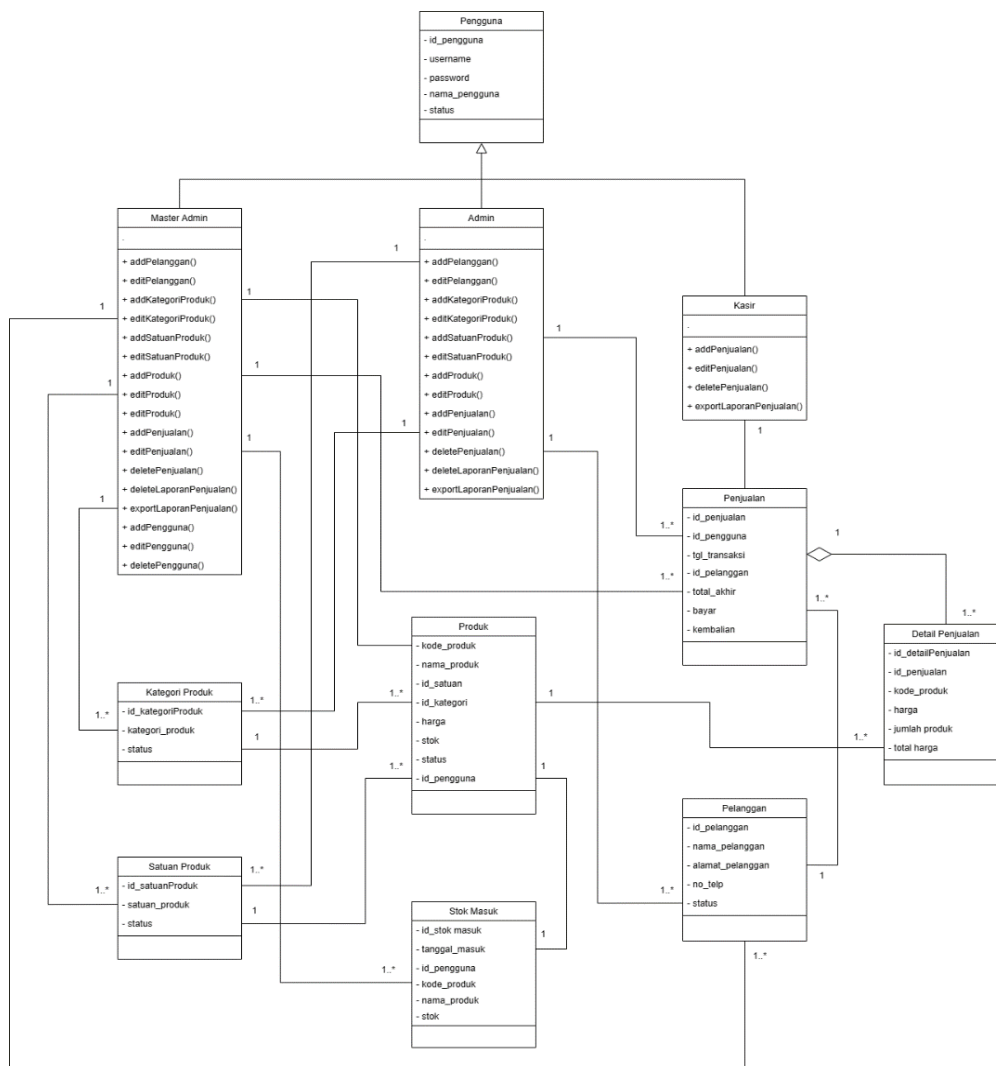


Figure 4. Class Diagram

3.5. System Implementation

Login page shown in figure 5. Figure 5 is login page before the user can enter or access the system. Login can be done by the user by entering the username and password that was created by the master admin. The users who are not registered cannot enter the system. On the login page there is also a forgot password feature where if a user forgets the password on their account, the system will send a new password to log in.

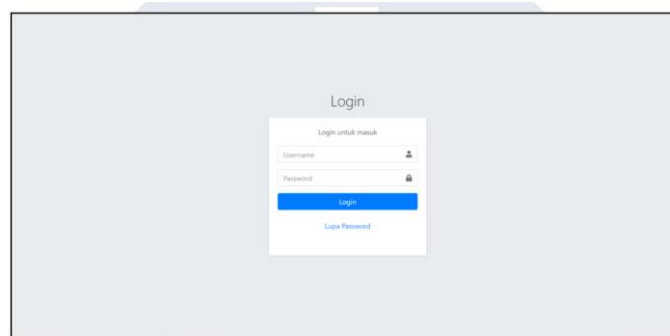


Figure 5. Login Page

After successfully login to the system, the first page that can be seen by a user when entering the system is the dashboard page, which can be seen in figure 6. Based on figure 6, we can show that this page contains general information related to inventory and sales of the day, such as total users, today's transactions, and some charts, i.e., best-selling products, and stock products. The tab on the left side, in the upper corner, there is a logo of Cik Cik Meatshop and Frozen Foods, and underneath there are menus that can be accessed on the system, namely dashboard, customers, products, transactions, sales reports, settings, and users.

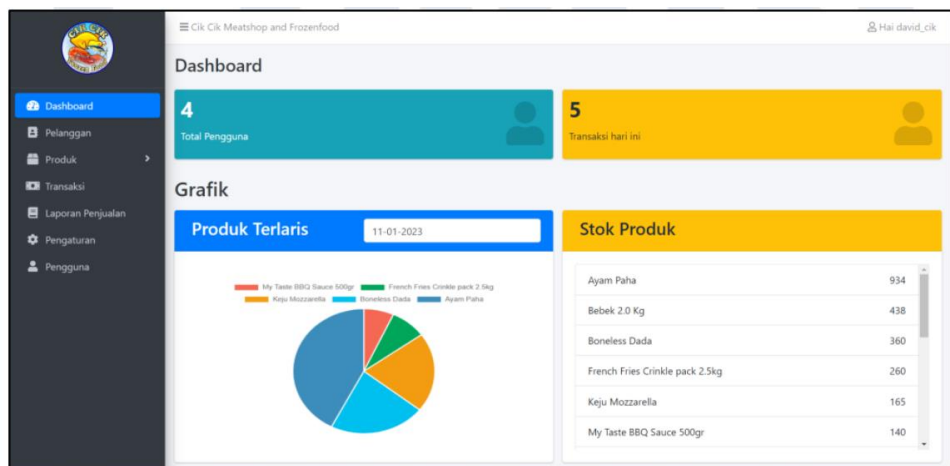


Figure 6. Dashboard Page

Transaction page can be seen in figure 7. Based on figure 7 we can see that the transaction page is used when the user wants to add sales that are currently or have occurred. On this page, the user can enter the name of the product along with the amount items. After that, a table shown the products purchased by customers. This table contains product code, product name, price, and the total quantity of the product. Product the active ones will appear in the product drop-down and can be selected or sold and vice versa for inactive products. If a product is to be deleted, the user can do so by clicking the delete button, and the product will be removed from the sales query field.

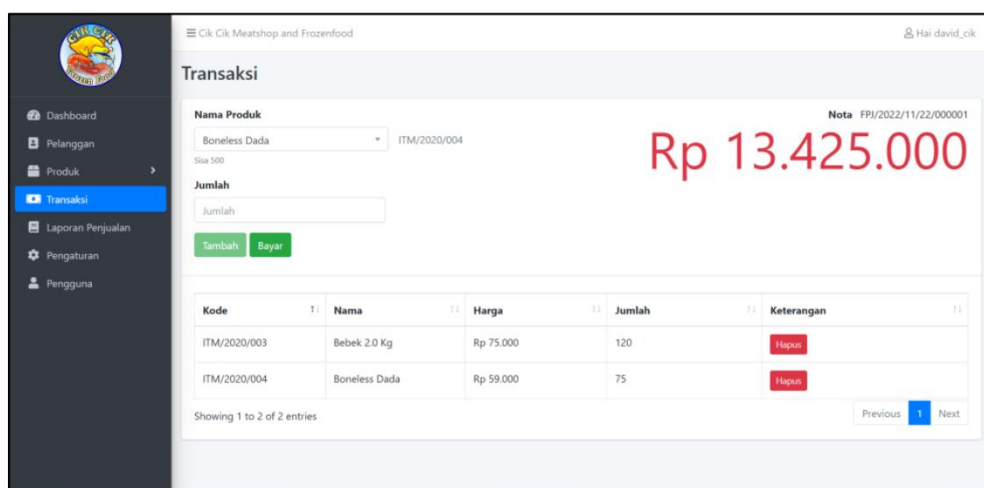


Figure 7. Transaksi (Transaction) Page

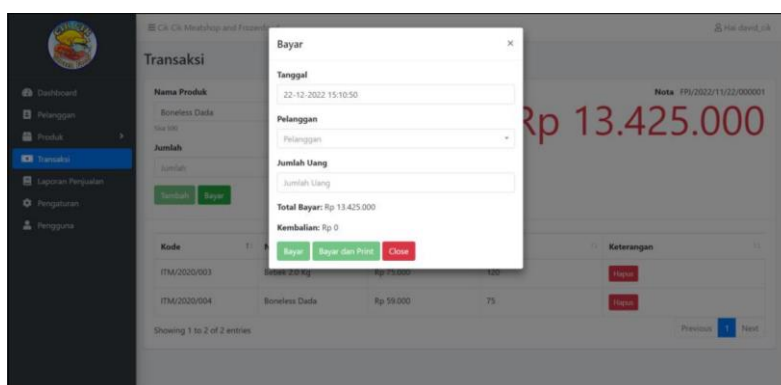


Figure 8. Payment Confirmation Form

Payment confirmation shown in figure 8. Figure 8 is a pop-up to confirm payment of sales transactions that occur. In the popup, the user can specify a date (if the transaction has occurred), customer name, and the amount of money paid. If the customer is active, his name will appear on the customer drop-down. If it is not active, then the customer's name is not will appear. Underneath there is a total payment that automatically accumulates from the total price of all products purchased by that customer, as well as the change which is automatically calculated from the difference between the amount paid and the total amount paid. If the user does not fill in these fields, the payment cannot be made resumed and only the close button can be clicked. Users can also select options to pay or pay and print. If the user chooses to pay only, then the transaction will automatically be stored in the database and entered into sales reports, but receipts or invoices will not appear. If the user chooses to pay and print, it will a receipt or invoice appears in pdf format containing information regarding the sales transaction, along with the user who handles the transaction.

3.6. User Acceptance Test (UAT)

UAT is performed to determine if the outcomes of this research match expectations [10]. After designing a web-based information system for inventory and sales of Cik Cik Meatshop and Frozen Foods, testing was also carried out by conducting UAT to get the prospective of the users of system performance. UAT results can be seen in Table 2. Based on Table 2, it showed that all the features on the web design can run well and according to their functions. In the next stage, based on the results of UAT, an analysis will be carried out to see the comparison of the Company's business processes before and after using the proposed design such shown in Table 3.

Table 2. User Acceptance Test

No	Features	Descriptions	Expected results	Status
1	Manage Customer Data	Users manage customer data, such as adding and editing customer data	New customer data will appear on the customer page. In addition, the system will display a successful message on the changed data.	Pass
2	Manage Product data	Users manage product category data, such as adding and editing product category data	The new product category data will appear on the product category page.	Pass
		Users manage product unit data, such as adding and editing product unit data	The new product unit data will appear on the product unit page.	Pass
		Users manage product data, such as adding and editing	The new product data and remaining stocks will	Pass

No	Features	Descriptions	Expected results	Status
4	Manage Sales Transaction	product data, and know the product stocks Users add existing or existing sales transactions by filling in the required fields and pressing the Pay or Pay and Print button to confirm transaction payments.	appear on the product unit page. The transaction data will be saved to the sales report and also to the database (pay button). A receipt or invoice will appear and can be printed. Transaction data will also be saved to sales reports and the database (Pay and Print buttons).	Pass
5	Manage Report	Users export the internal sales report specified period, by pressing the Export button. In the Master Admin role, the user can print or delete transaction data that has already occurred	The sales report will be exported or downloaded in the form of an Excel file. If successful, transaction data will be printed, as well as deleted data will be deleted from the sales report.	Pass
6	Manage Users	Users manage user data, such as adding and editing data.	The new user data will appear on the product page. In addition, the system will display a success message on the changed data.	Pass

Table 3 Performance comparison of before and after system implementation

Category	Before	After
Inventory	In the inventory section, checking and input are still being carried out manually, namely handwriting and input into Microsoft Excel one by one. This resulted in several problems arising, such as human error, human fraud, inaccuracies, or loss of data related to inventory owned by the Company.	Inventory data management becomes easier and more organized because the incoming data will be in the existing database so that problems such as human error, human fraud, inaccuracies, or loss of inventory can be avoided. Data can also be exported related to the inventory they have so that it is possible to carry out analysis and decision-making.
Sales	Sales records that occur are also still using paper whereas notes for receipts or invoices are also done by hand. This can result in fraud, errors, or data loss if not considered. The same thing is also done on sales reports recorded with Microsoft Excel.	From each transaction that occurs, the user can directly input the system so that transactions that occur can be directly stored in the system database. Receipts or invoices can also be printed from pdf files, and reports can be printed as Excel files. This facilitates business processes because the system becomes more automated and integrated so that reports and notes can be stored

4. CONCLUSION

A web-based information system had been successfully developed for Cik Cik Meatshop and Frozen Foods for managing inventory and sales in their business processes. The proposed system had some features. First, user management to manage the access of the system. Second, product management involves adding and modifying product and keeping track of product

stockpiles. Third, manage reports to show reports and export sales data to Microsoft Excel or pdf. Afterward, adding and changing product category information and product unit information. Next, managing sales transactions for new or existing sales transactions to reflect any sales information. Finally, handling customer information including names, addresses, and phone numbers automatically.

Cik Cik Meatshop and Frozen Foods got some benefits by implementing this system, especially for inventory and sales management. For an inventory management, the incoming data will be in the existing database, making inventory data administration simpler and more structured. This will help to prevent issues such as human error, human fraud, inaccuracies, and inventory loss. The inventory data can be exported into excel file or pdf file to be used for analysis and decision-making. For sales management, user has the option to immediately input the system from each transaction, allowing it to be directly recorded to database system. Reports can be printed as excel files and receipts or invoices can be created from pdf files. The system becomes increasingly automated and integrated so that reports and notes may be stored, which streamlines corporate procedures.

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