
Website-Based Information System Design At Cahaya Harapan Jaya Building Shop

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ABSTRACT

Building material stores play an important role in providing building materials, but many still rely on conventional management systems that are less efficient in recording stock, transactions, and employee data. This results in delays in recording transactions, errors in stock monitoring, and the lack of an effective system in managing employee data. Therefore, this study aims to design a web-based information system to improve the operational efficiency of building material stores. This study uses the Waterfall method which consists of needs analysis, design, programming, testing and implementation of this system also use blackbox testing and system usability scale (SUS) testing. This system is designed to make it easier for administrators and employees to manage products, transactions, employee data, and financial reports in real-time. The results of the study show that the web-based information system improves the efficiency of transaction recording, minimizes stock monitoring errors, and simplifies the management of employee data and financial reports. This system allows building material stores to optimize operational performance, improve data accuracy, and provide better customer service.

Keywords: Building Material Store, Information System, Website, Stock Management, Transactions.

INTRODUCTION

Building material stores are vital in supplying essential construction materials for large projects and individual needs. These stores support the construction sector, but many still rely on manual systems to manage transactions, inventory, and employee data (Rizki et al., 2023). Such conventional methods often lead to operational inefficiencies, including delays in transaction recording, errors in stock management, and difficulties in maintaining accurate employee records (Setiawan Wibowo & Ardiansyah, 2023). As businesses expand and the demand for materials grows, these challenges become more pronounced. To address these issues, a web-based information system is needed to improve the efficiency and accuracy of store management, allowing for smoother and faster operations (Purnama, Ritonga, Pane, Bangun, & Saputra Pratama, 2020).

This research aims to design and develop a web-based information system that will assist building material stores in managing product data, transactions, inventory, and employee information more effectively (Jurnal, Jakaria, & Sentosa, 2019). The main problems of the research are the inefficiency and errors caused by manual methods in handling operational tasks. By utilizing a web-based system, store managers and employees will have access to real-time data, allowing them to manage stock, record transactions, and oversee employee information more efficiently and accurately (Nicolaus, Maulana, Baskoro, & Rosyani, 2022). The goal is to create a reliable, user-friendly system that eliminates manual

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record-keeping, reduces errors, and improves the overall flow of store operations(Setiawan, Anggara Wijaya, & Estiyanti, 2021).

This research aims to design a web-based system that integrates several business processes into a single platform, including inventory management, transaction recording, and employee data management(Wongso, 2015). By centralizing data, the system will enhance real-time decision-making and help store managers maintain accurate records. Key features of the system will include real-time inventory tracking, transaction management, employee record-keeping, and report-generation tools(Setiawan et al., 2021). The system will be easy to use for administrators and employees, ensuring that it can seamlessly be adopted into daily operations(Gultom & Maryam, 2020).

This research contributes to developing a technology-driven solution for building material stores, enabling them to improve efficiency, reduce human error, and offer better customer service(Maulida et al., 2023). The proposed system will also provide valuable insights through reporting tools that help store managers make informed decisions regarding stock management, sales, and employee performance(Sarjono, Wicaksono, & Pradana, 2018). Additionally, the system will be adaptable and scalable, ensuring it can meet the evolving needs of growing businesses. This research will contribute to the digital transformation of the building material industry, enhancing operational efficiency and positioning businesses for success in the digital age(Hermawan & Fauzi, 2021).

LITERATURE REVIEW

A web-based cashier system is an application that records and manages sales transactions electronically by utilizing web technology. This system has advantages such as high accessibility, centralized data management, and ease of integration with hardware such as receipt printers(Luh Suminiasih, Ada Gelgel Suryawan, Made Estiyanti, & Nyoman Yudi Anggara, 2023).

A. Main Features of Web-Based Cashier Systems

1. Product Management: Provides functions to add, change, and delete product data.
2. Sales Transactions: Record transactions that include customer data, product details, and payment methods.
3. Transaction Reports: Provide daily, weekly, and monthly reports for sales analysis.
4. User Management: Set user access rights such as admin and cashier.

B. Supporting Technology

1. Frontend: Technologies like HTML, CSS, and JavaScript for user interfaces.
2. Backend: Frameworks such as Laravel or CodeIgniter are used to manage business logic.
3. Database: MySQL or PostgreSQL for data storage.

Cloud Hosting: Platforms such as AWS or Heroku for storing and managing applications.

METHOD

Software Development Life Cycle (SDLC) is a method for creating quality software that can be developed according to customer expectations. The Waterfall Model is one of the SDLC models. The waterfall method is a sequential software development process in which progress is considered to be increasingly slow, like a waterfall through a list of steps that must be taken to build computer software successfully. The first waterfall Model was proposed by Winston W. Royce in 1970 to describe the potential practice of software engineering. This study uses the waterfall method, consisting of a series of stages passed sequentially: needs analysis, design, programming, testing, and implementation.

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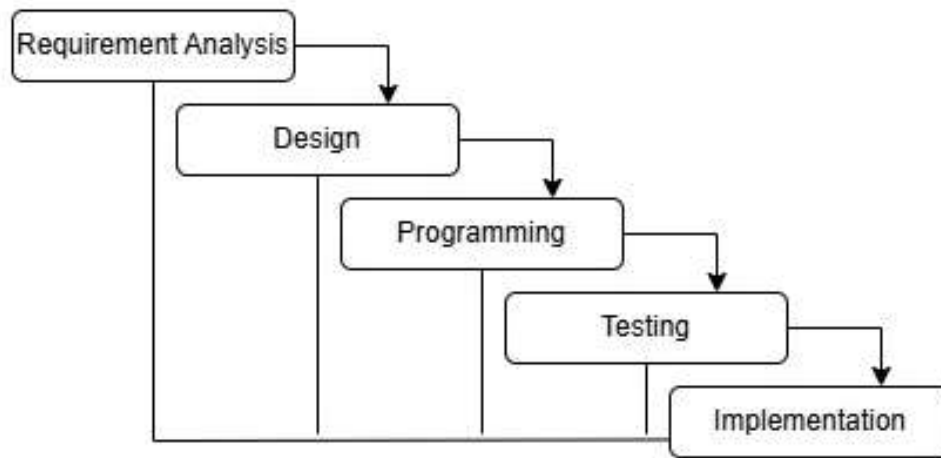


Figure 1 Waterfall Method

Needs Analysis

Software Requirements Specification or Software Requirements Specification (SKS), namely A comprehensive analysis of the behavior of the software to be developed involves system and business assessments to determine functional and non-functional requirements. Needs analysis consists of the following components: functional needs analysis, which shows the procedures or functions that the system must run to meet user needs. Functional requirement analysis is as follows: managing goods data, managing reports/recapitulations of incoming and outgoing goods, goods provider transactions, and sales; this non-functional requirement analysis is a requirement that describes time constraints, development processes, and standardization of a system's operations. According to, non-functional requirements are system requirements that include hardware and software used to support the design process. The system can be run using a laptop/computer with a minimum Intel Core i3 Gen 5 Processor operating system, 2GB RAM, and 32GB Storage. It can be accessed using an Android or IOS-based cellphone, cellular data, or wifi via a browser such as Google, Opera Mini, Chrome, Mozilla, and other browsers.

Design

The design stage is a system design activity and problem-solving process. This system design process has four design classifications: use case diagrams, activity diagrams, user interface mockups, and entity relationship diagrams (ERD).

1. Use case diagram to Ivan Jacobson, in 1986, proposed a use case diagram in use cases. Use cases are a methodology used in analyzing systems to identify, clarify, and organize a system. Use case diagrams are used in UML (United Modeling Language), a standard for modeling objects in real-world systems. Figure 2 describes a system that has two extends, namely admin and employee, who have different access for admin, namely login, processing sales transactions, processing product data, viewing and printing reports, processing store data, and processing user data, then for employees including login, processing sales transactions, processing product data and processing store data.

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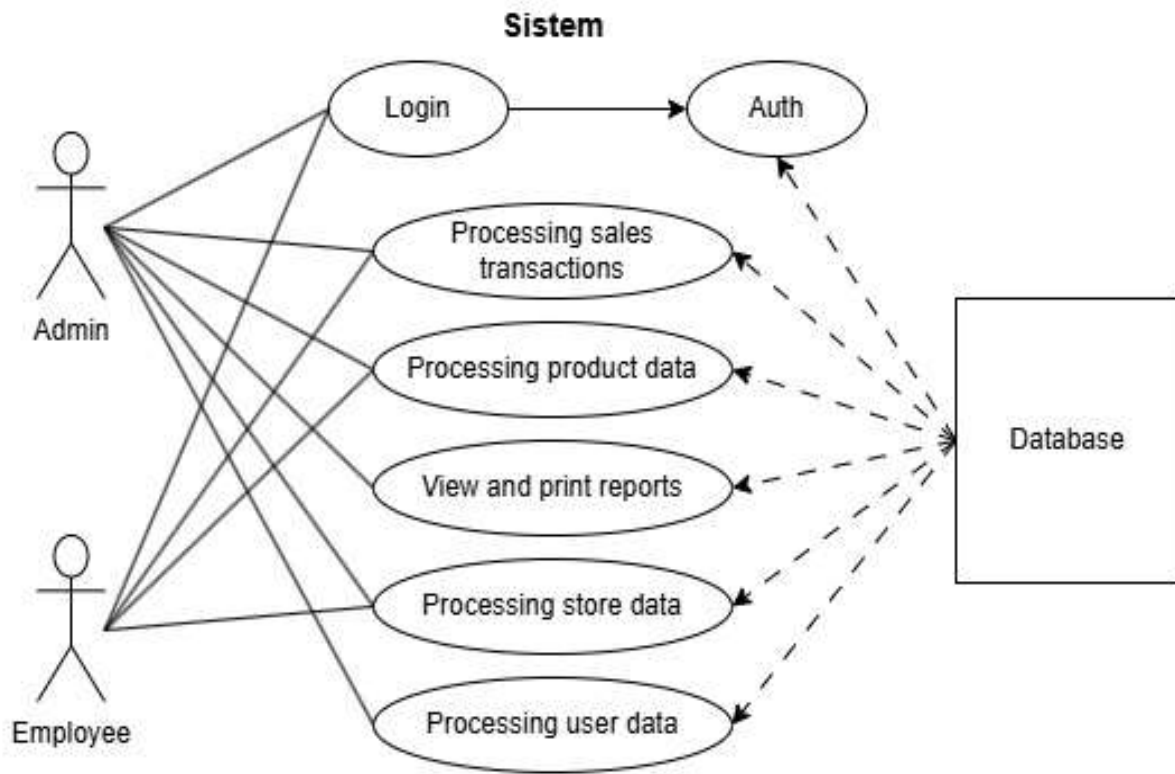


Figure 2 Usecase Diagram

2. An activity diagram is modeling the workflow of a business process and the sequence of activities in a process [19]. The activity diagram in the Cahaya Harapan Jaya building store has two extensions: Admin and Employee. Figure 3 shows the admin activity diagram, namely, the shop owner logs in, is checked by the system if successful in entering the main page, displays transaction data can change and save transaction data, displays product data can add and save products, displays transaction reports transaction checking process according to transaction date, displays store data can change and save store data and displays admin and employee data can add, modify and delete users then saved. Figure 4 shows the activity diagram of a store employee logging in, entering an email and password checked by the system, displaying transaction data can change and save transaction data, displaying product data can add and save products, and displaying store data can change and save store data.

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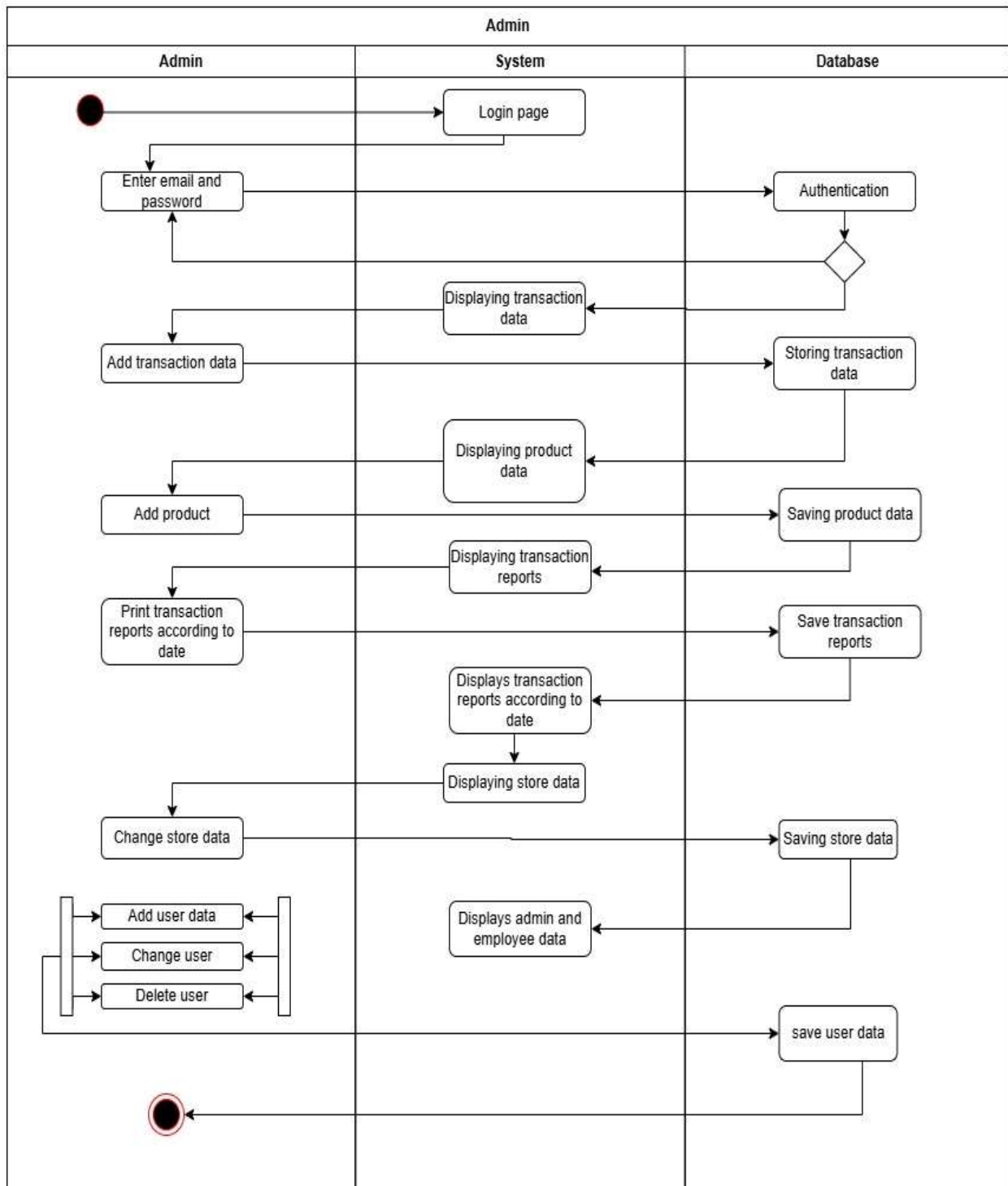


Figure 3 Activity Diagram Admin

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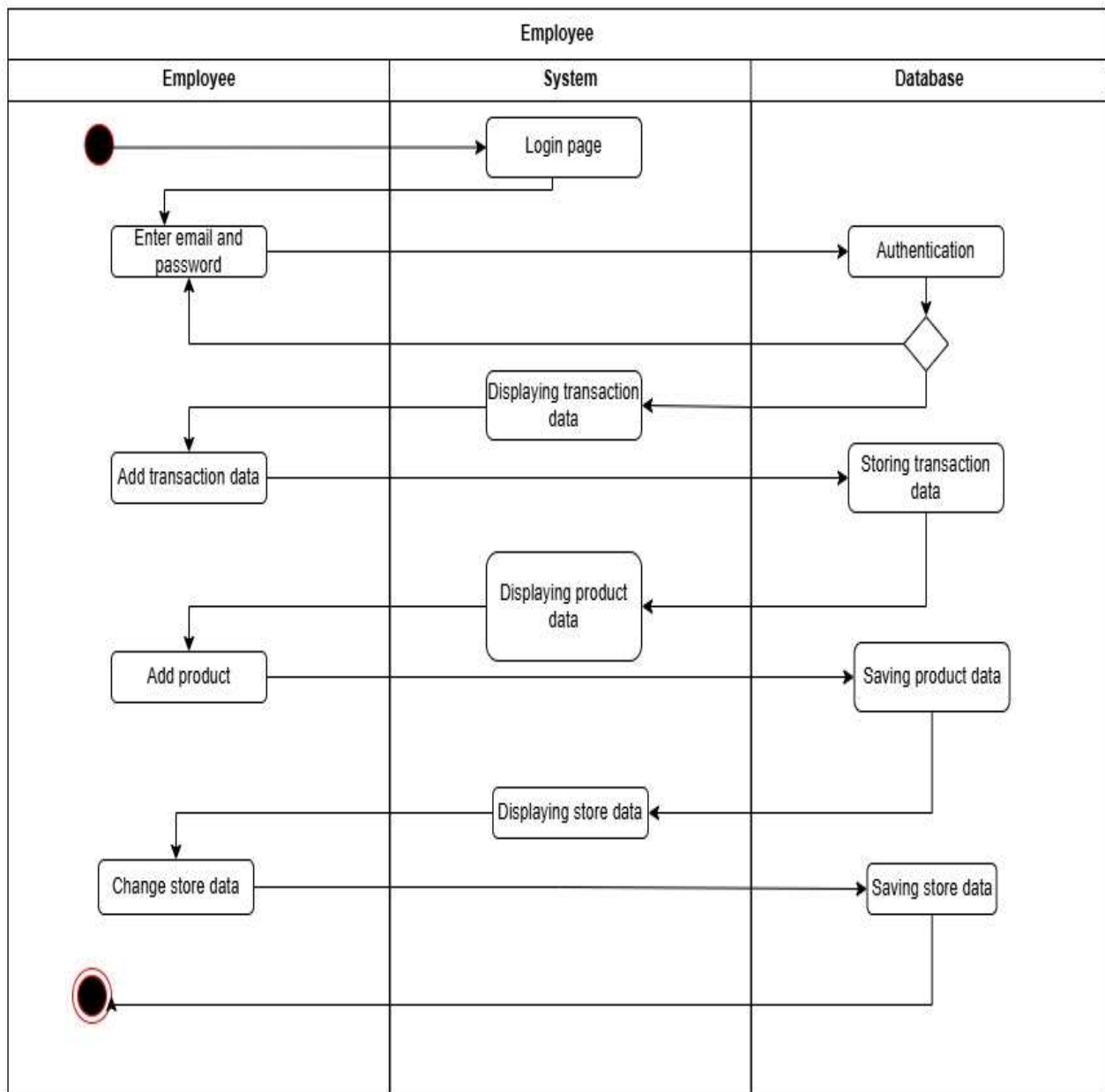


Figure 4 Activity Diagram Employee

3. Mockup User Interface Design According, a mockup user interface design is a static visual representation of the layout, structure, and elements that will appear in the user interface of a product or application. Good interface design requires a deep understanding of the work practices in the context of the tasks that the computer will support to adequately represent these practices in the system design specification. Figure 5 shows the login page. Figure 6 shows the dashboard page.

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Figure 5 Login page mockup

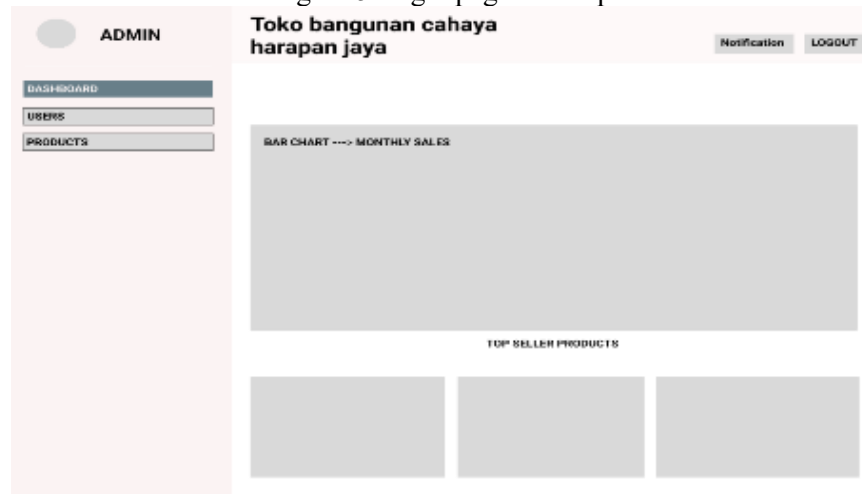


Figure 6 Menu page mockup

4. Entity Relationship Diagram (ERD), According, each entity is described from graphic notation into a data diagram so that all transactional data processing can be clearly defined. Figure 5 to design a database on this system, namely Admin, employees, products, transactions, store data, and employee data.

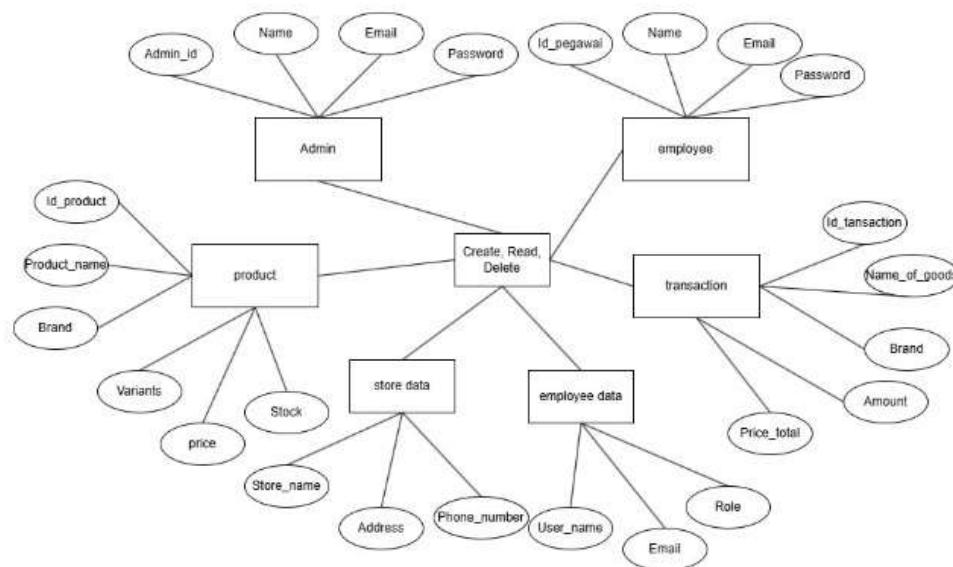


Figure 7 Entity Relationship Diagram

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Programming

The stages for implementing scenarios and designs are then implemented with a system designed according to needs. Each component or feature of the system, such as inventory management, sales transactions, reports, store data management, and employee data management, is programmed according to the specifications set. Features are developed and tested separately to ensure that each part functions properly. Programming is done in a structured manner to facilitate integration between features when the system is built. The translation process uses the programming language (PHP) Hypertext Processor, (HTML) Hypertext Markup Language, and (CSS) Cascading Style Sheet, the Laravel framework, and database processing using MySQL.

4. Testing

The next stage is testing to ensure that the system functions as expected and detect bugs or errors. Some types of testing include functional testing to ensure that each feature runs according to plan; if problems or deficiencies are found, repairs are made before proceeding to the implementation stage. Testing on this system uses the black-box method, software quality testing focusing on system functionality, and the system usability scale (SUS), which tests with a questionnaire.

5. Implementation

Implementation stage. The completed system is installed and implemented in a real environment or a brick-and-mortar store server at this stage. End users, such as owners and employees, use the system directly to run store operations. Training is provided to users so that they can use the system effectively. Initial monitoring is carried out to ensure that the system is running smoothly and there are no significant problems after implementation.(Hasbid, Yusuf, & Muharni, 2021).

RESULT

Implementing a web-based information system for building material stores has significantly improved several aspects of store management. The system has successfully addressed the inefficiencies associated with manual methods by automating key processes and centralizing data management. The results from the testing phase indicate a notable reduction in transaction recording errors and delays, as well as an improvement in stock management accuracy. Store managers and employees have reported more straightforward access to real-time information, enabling quicker decision-making and improving the overall workflow.

One of the system's primary outcomes is the enhanced accuracy of inventory management. The system's real-time tracking feature allows store managers to monitor stock levels continuously, preventing overstocking or stockouts. This has led to better control over inventory and reduced the chances of running out of critical materials. Additionally, the automated alerts for low stock levels have enabled proactive restocking, minimizing disruptions in customer service.

Another significant improvement is the streamlined transaction process. The web-based system has automated sales transactions, reducing the time spent on manual data entry and minimizing errors in the recording of sales. This has sped up the checkout process and reduced the likelihood of discrepancies in financial records. As a result, customers experience faster service, and the store has been able to maintain more accurate financial data.

Employee management has also been significantly improved. The system provides a centralized platform for managing employee information, including schedules, performance records, and payroll data. This has simplified the administrative tasks associated with employee management, allowing managers to focus on more strategic aspects of store operations. Employees have expressed satisfaction with the transparency and accessibility of their records, leading to higher job satisfaction and engagement.

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Furthermore, the system's reporting feature has provided valuable insights into the store's financial and operational performance. Store managers can now generate detailed reports on sales, inventory levels, and employee performance. These reports have proven invaluable for making data-driven decisions, such as adjusting stock levels or evaluating the effectiveness of sales strategies. Overall, the web-based system has increased the operational efficiency of the building material store, improved customer satisfaction, and contributed to a more organized and streamlined work environment.

In conclusion, the web-based information system has substantially benefited building material stores. It has enhanced the accuracy and speed of transaction processing, improved inventory management, and simplified employee administration. The system's ability to provide real-time data and generate detailed reports has enabled better decision-making and a more efficient workflow. These results demonstrate that web-based systems can significantly transform the operations of building material stores, positioning them for success in a competitive market.

DISCUSSIONS

System testing

This system testing uses the black box method on the Cahaya Harapan Jaya building store cashier system to ensure that the sales transaction feature runs according to needs (Nidhra, 2012). This method involves asking several questions that describe the system that has been created and to what extent the system that has been implemented can run according to user needs. This testing method is described in Table 1.

Tabel 1. BLAC-BOX TESTING

No	PENGUJIAN	Hasil Yang Diharapkan	Status Valid
1	Email: Correct Password: Wrong	Correct Login is successful, so enter the dashboard page. Valid	Valid
2	Email: Wrong Password: Wrong	Wrong Login unsuccessful Valid	Valid
3	Add, search, edit, and delete products	Products successfully added can be searched, updated, deleted, and saved in the database.	Valid
4	Input product data	Product data was successfully entered and displayed in the shopping cart.	Valid
5	Payment process	Payment receipt printed	Valid
6	Validation of stock of goods	The number of purchases exceeds stock.	Valid
7	Monthly sales report testing	The system displays transactions during the selected month.	valid
8	Admin/employee logout	Successfully exited and was directed to the login page.	Valid

The system testing of the Cahaya Harapan Jaya building shop provides results that illustrate the extent to which the implemented system can run well and according to user needs. This test includes validation of

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the features created through 8 implemented tests that produce valid output as a form of assurance that the system is able to achieve the goals and expectations that have been designed.

System Usability Scale (SUS) Testing

After testing the Blackbox method, the system will be tested using the System Usability Scale test, which will be carried out to evaluate the ease of use (Usability) of the Cahaya Harapan Jaya building store cashier system. This method uses 10 statements filled in by the user, and then the respondent will provide an assessment on a scale of 1-5, ranging from strongly agree to strongly disagree (Alshamari, 2023). The test analysis is calculated using the following formula:

- For odd questions, the answer score is reduced by 1
- For even questions, five is diminished by the score
- Add up all the results from the even and odd scores, then multiply by 2.5

Tabel 2. HASIL PENGUJIAN SUS

Resp.	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Skor SUS
1	3	2	3	4	3	3	4	3	3	4	32	80
2	3	3	3	4	4	2	3	3	3	2	30	75
3	3	2	4	2	4	2	3	2	4	4	30	75
4	3	2	4	2	2	2	4	2	4	2	27	68
5	2	2	2	4	3	2	1	3	4	3	26	65
6	3	2	2	1	2	3	4	2	4	4	27	68
7	2	4	3	4	2	2	2	3	3	1	26	65
8	3	3	3	3	2	2	2	3	3	1	25	63
9	4	1	2	0	4	3	2	4	3	0	23	58
10	2	3	3	1	2	1	2	4	3	3	24	60
11	3	2	3	0	0	3	3	3	3	3	23	58
12	1	3	0	1	2	4	1	3	3	0	18	45
13	3	2	2	3	3	2	2	3	3	1	24	60
14	1	1	2	3	3	3	3	4	4	3	27	68
15	0	2	1	3	2	3	4	1	3	3	22	55
16	3	3	4	1	4	3	3	4	1	2	28	70
17	1	1	2	2	4	3	3	3	2	3	24	60
18	2	3	3	3	3	2	1	3	3	3	26	65
19	4	4	4	3	3	2	3	2	4	3	32	80
20	4	4	4	4	3	2	3	3	4	0	31	78
21	4	3	4	4	4	3	4	3	4	3	36	90
22	4	4	2	1	4	3	3	4	4	3	32	80
23	3	0	1	4	3	3	4	3	4	4	29	73
24	4	3	3	4	4	3	3	2	3	3	32	80
25	3	4	4	4	3	2	3	3	1	0	27	68
26	4	3	4	3	4	3	3	1	3	4	32	80
27	3	4	4	4	3	2	3	3	4	4	34	85
28	4	3	3	4	4	3	3	4	4	3	35	88
29	2	3	4	4	3	2	3	3	4	4	32	80
30	4	4	4	4	3	2	3	3	4	2	33	83
Rata-rata												71

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Based on the test results above, 30 respondents were interviewed: 28 general public, one employee, and one shop owner. The data collected was then processed to obtain results with a final average score of 71, then compared with the SUS Score assessment standard to get an assessment graph in Figure 23

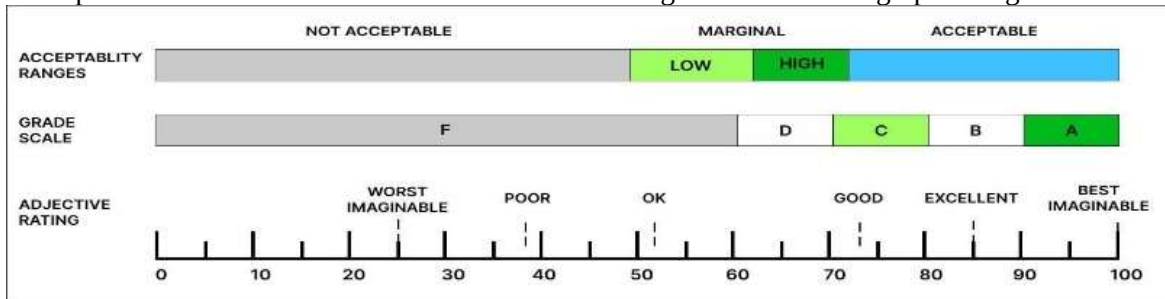


Figure 23 system usability scale assessment graph

Based on the results of the Cahaya Harapan Jaya building store cashier system test, it scored 71 in the good category, which means it is quite easy to use and meets the SUS assessment standard.

CONCLUSION

The design of a website-based information system for the Cahaya Harapan Jaya building store has successfully overcome the problems of managing sales data and stock of goods that were previously done manually. This system simplifies the sales transaction process, product data management, transaction reports, and employee and store data management. The system development uses the Waterfall method with PHP, HTML, and CSS programming languages, the Laravel framework, and MySQL database. Testing using the Black-Box method and System Usability Scale (SUS) shows valid results and is suitable for use. This system is expected to improve operational efficiency and customer satisfaction.

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