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Implementation Of An Inventory System For A Conventional Wholesale Store Using The Codeigniter Framework

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ABSTRACT

Toko Nor'In, toko kelontong kelas menengah yang didirikan pada tahun 1999, berfungsi sebagai gerai grosir yang memasok kebutuhan pokok dan makanan utama, serta melayani langsung kebutuhan konsumen. Toko ini juga menyediakan layanan pengiriman kepada *downlines* atau pelanggan setia di wilayah Kecamatan Tengaran. Toko Nor'In masih mengandalkan sistem pencatatan stok manual, yang sering menimbulkan masalah serius seperti ketidakakuratan data dan rendahnya efisiensi operasional. Penerapan sistem terkomputerisasi menjadi solusi untuk meringankan beban kerja karyawan dan meningkatkan bisnis. Sistem inventaris baru ini dikembangkan menggunakan metode Waterfall, sebuah pendekatan terstruktur empat tahap: definisi kebutuhan, perancangan sistem, implementasi, dan pengujian. Metode ini memberikan panduan yang jelas dan efisien, memastikan sistem memenuhi harapan pengguna. Sistem informasi ini dibangun menggunakan PHP, Visual Studio Code, dan SQL. Untuk pengujian, digunakan Black Box dan System Usability Scale (SUS). Hasil Black Box menunjukkan fungsionalitas bekerja optimal. Sistem menerima skor SUS 69, dikategorikan sebagai "Baik," yang menegaskan telah memenuhi standar pengguna untuk akseptabilitas dan kemudahan penggunaan.

ABSTRACT

Toko Nor'In, a mid-range grocery store founded in 1999, operates as a wholesale outlet supplying necessities and staple foods, while also catering directly to consumers. The store provides delivery services to downlines or loyal customers within the Tengaran District area. Despite its operations, Toko Nor'In still relies on a manual stock recording system, which frequently leads to serious problems like data inaccuracies and low operational efficiency. Implementing a computerized system is a vital solution to lighten the workload of employees and provide significant benefits for the grocery business. The new inventory system was developed using the Waterfall method, a structured approach following four distinct stages: requirement definition, system design, implementation, and testing. This method ensures clear guidance and efficient management, guaranteeing a system that meets user expectations. The information system was constructed

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utilizing the PHP programming language, Visual Studio Code, and SQL. To verify its quality, the system underwent Black Box testing and System Usability Scale (SUS) testing. Black Box results confirmed the website's functionality works optimally. Furthermore, the system achieved a SUS score of 69, categorized as "Good," which affirms that it meets user standards for acceptability and ease of use.

INTRODUCTION

Toko Nor'In is a mid-range grocery store that was established in 1999. Toko Nor'In, founded by Mrs. Nuryah and Mr. Tabi'in two decades ago, is now continued by their children who are committed to providing and assisting with various daily needs for the surrounding community. This store is a wholesale outlet that supplies necessities or staple foods as well as directly to consumers need. This store is a wholesaler that provides necessities or staple foods as well as directly to consumers' needs. In addition to direct sales, Toko Nor'In also delivers goods to downlines or loyal customers living in the Tengaran District area. Since 1999 until now, Toko Nor'In still relies on a manual stock recording system. This method involves stock management using notebooks or procurement receipts recorded with a pen. The stock checking process is carried out through direct physical counting in the warehouse, which is time-consuming and labor-intensive. This manual system faces several problems, such as data inaccuracies due to recording errors and the risk of losing records, which often leads to discrepancies between physical stock and records. Additionally, operational efficiency is low due to the time-consuming process of recording and checking stock, especially when preparing monthly reports or searching for specific data. The implementation of technology, such as computerized systems, is necessary to lighten the workload of employees. Using a computerized system offers many benefits for grocery store businesses. An effective business management system is the core of every venture. This system must be managed optimally to ensure smooth daily operations (Anthony et al., 2017)

The development in the retail business today has utilized fast technology, allowing a business to obtain information quickly and accurately, thereby enabling a business to refine strategies and decisions swiftly. Developments in the retail business today have utilized fast technology, allowing a business to obtain information quickly and accurately, enabling it to refine strategies and decisions swiftly (Nasution et al., 2024). Current sales information systems can assist users in finding information related to sales.

The current sales information system can help users find information related to sales. This system functions to manage the business in a computerized manner, including recording, calculation, document creation, and sales information necessary for management and report recapitalization at Toko Nor'In. However, Toko Nor'In still uses a manual system for the sales and recording processes. (Herdiansyah et al., 2021a). Therefore, an inventory information system is needed in the store so that work activities can run more smoothly and enable the creation of business strategies and faster, more accurate decision-making (Herdiansyah et al., 2021b) (Muhammad Aditya Wijaya, 2025).

LITERATURE REVIEW

An inventory information system is a computerized solution designed to replace slow manual methods in tracking purchasing, sales, and stock. Implementing this system significantly enhances operational efficiency and data accuracy through real-time transaction recording, thereby minimizing the risk of human error. Beyond mere recording, the system applies strategic inventory management principles inventory management aims to maintain an optimal stock balance to

prevent financial losses caused by overstocking or lost sales opportunities due to stockouts (Intan, Isnaini Khisanah, Nur Fatmawati, Azizah, 2024). Regarding software development, this system is built using the CodeIgniter framework. CodeIgniter utilizes the *Model-View-Controller* (MVC) architecture, which separates business logic, user interface, and process control. This MVC structure ensures the application delivers lightweight performance, enhanced security, and facilitates easier code maintenance for developers in the future (Herdiansyah, 2021a).

METHODS

The inventory system to be developed for toko Nor'in uses the waterfall method, which This research adopts the Waterfall approach, which flows systematically through a series of structured phases. This method is structured and provides clear guidance for the development process, making it ideal for the implementation of projects with clear specifications and consistent conditions.

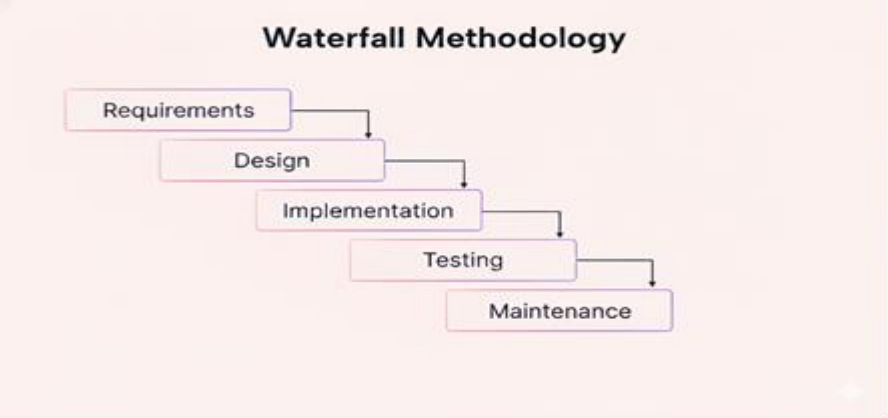

Figure 1. Waterfall methods

This research adopts the Waterfall approach, which flows systematically through a series of structured stages. The Waterfall method provides a clear and organized structure, allowing researchers to manage the research efficiently and effectively according to the established objectives. The Waterfall process consists of four main stages, namely requirement definition, system and software design, implementation, and testing. These four stages are carried out sequentially to produce a system that meets user needs and expectations (Yuono, 2024) (Purwandari & Fauzi, 2020a).

Requirements

At this stage, the researchers begin several initial steps in the development of the information system. They explain several requirements that will be necessary to help users understand how the information system works well (Kadek et al., 2021) To obtain data, the involved individuals were interviewed to determine the functional and non-functional specifications of the system to be built. Requirements related to how the system operates are referred to as functional requirements, which pertain to the needs directly associated with how the system functions (Purwandari & Fauzi, 2020a). This includes various needs required for the system to achieve its objectives, including the need to perform operations, process data, and transfer information. In this study, the functional requirements for Nor'in Grocery Store include product management capabilities, where the admin has the authority to add, modify, and delete products, also the features on that app could be managing the stock so they easily check and order new stock from the website (Adegbaju, 2020). The non-functional requirement in this study is an information system that is easily accessible

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through a compatible browser when opened on a desktop (Purwandari & Fauzi, 2020b) (Aulia Aziiza & Fadhilah, 2020) (Chukwumuanya, Emmanuel Onwurah, Uchendu O, 2024).

Use Case Diagram

At this stage, the focus is on creating a design that integrates all system components by designing an appropriate system architecture structure. The UML (Unified Modeling Language) approach, which is a visualization technique used to facilitate system development with object-oriented concepts, is used in the system design process. The UML approach includes task diagrams to show actor interactions with the system, activity diagrams to show the stages of system usage, and database design diagrams (Sonata, 2019) Use Case Diagram Application diagrams are figures of the interaction between system users and the system, and the system is itself. This diagram illustrates the many interconnected interactions between actors and functions within the system (Kurniawan et al., 2022; Ramadhan et al., 202 C.E.) The application diagram allows you to clearly see how actors and users interact with various facilities.

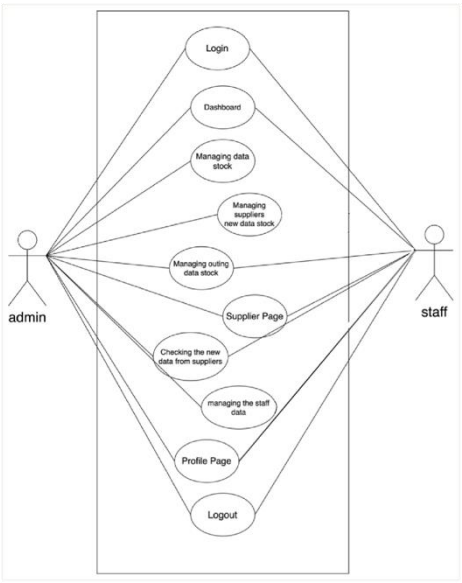

Figure 2*. Use Case Diagram managing stock report*

In Figure 2, it depicts a Use Case Diagram of a web-based inventory stock system. There are 2 actors, namely the admin and the staff. The admin is responsible for managing product data, reordering items when stock is low and creating inventory reports for analysis and decision-making. The admin also monitors the overall stock and receives low stock notifications. The staff can carry out activities such as account registration, login and logout, and daily operations by monitoring stock levels, receiving and confirming goods from suppliers, and responding to low stock notifications to maintain product availability.

Activity Diagram

Activity diagram is a diagram used in the system modeling process to illustrate the interactions between entities in the system (Pratasik Gabriel J. M. Topah, 2023) This diagram helps to illustrate the flow of activities that occur within the system, such as processes, activities, and interactions between entities.

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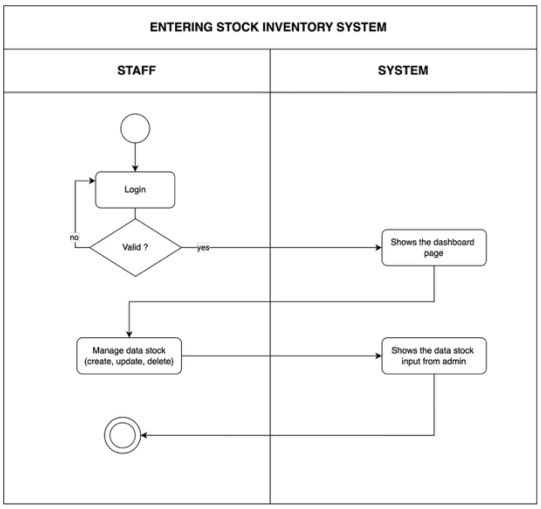

Figure 3. ***Activity Diagram Staff***

The figure above explains the process of entering new stock data. The activity diagram for the Stock Inventory System illustrates the workflow of user interactions, clearly delineating the sequence of actions between the 'Staff' and the 'System' actors within their respective swimlanes. The process commences when the Staff initiates a login action to gain access to the system. Following this attempt, the System performs a critical validation check to authenticate the user's credentials. If the credentials are found to be invalid, the workflow loops back, requiring the Staff to re-attempt the login, thereby ensuring that only authorized users can proceed. Conversely, upon successful validation, the System grants access and displays the main dashboard page to the user. Subsequently, the Staff is empowered to perform the core stock management functions, which include the creation of new stock items, the updating of existing records, and the deletion of obsolete entries. In response to any of these management actions, the System provides immediate feedback by updating and displaying the revised stock data, confirming to the user that the operation was processed successfully. The workflow concludes at the final state, signifying the completion of a single, successful stock management cycle. Overall, the diagram effectively models a secure, interactive, and sequential process for inventory management, highlighting the clear separation of responsibilities and the logical flow of control between the user and the system.

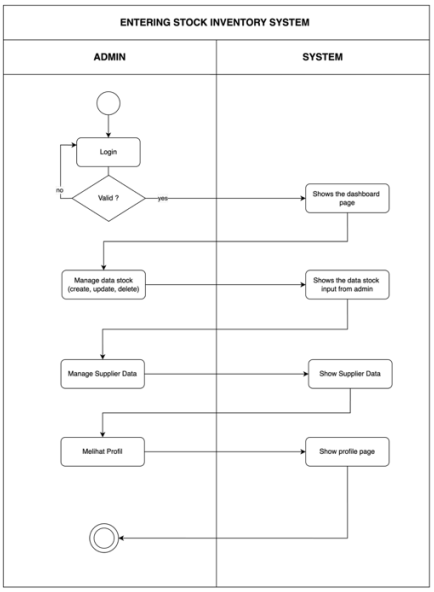

Figure 4. ***Activity Diagram***

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Admin

Figure 4 explains the flow or process by which the admin can perform CRUD (Create, Read, Update, and Delete) on the stock data in the warehouse. Admin can perform a special administrator login before accessing the dashboard page. Administrators can manage product data by performing CRUD operations (Create, Read, Update, and Delete). The activity diagram for the "Entering Stock Inventory System" illustrates a comprehensive workflow for an administrator, detailing the sequence of interactions between the 'Admin' and the 'System' actors. The process commences when the admin initiates a login attempt, which is then subjected to a validation check by the System. Should the credentials be invalid, the user is required to re-attempt the login until a successful authentication is achieved. Upon valid entry, the System presents the main dashboard, granting the admin access to a series of sequential functionalities as depicted. The admin first engages in managing stock data, which includes creating, updating, or deleting inventory records, with the System responsively displaying the data changes. Following this, the workflow proceeds to supplier data management, where the admin handles supplier information and the System, in turn, shows the relevant supplier data. The next step involves the admin viewing their profile ("Melihat Profil"), to which the System responds by displaying the profile page. The process then concludes at the final node, indicating the completion of this specific, linear sequence of administrative tasks within the system.

Entity Relationship Diagram

An Entity Relationship Diagram (ERD) is a visual tool that serves to illustrate the interrelationships between entities or objects within an information system. This diagram displays these entities and clarifies the relationships established among them. An ERD is utilized to demonstrate the data structure and the interconnections between data elements in the form of a conceptual design (Devana Mulia & Yasin, 2025)

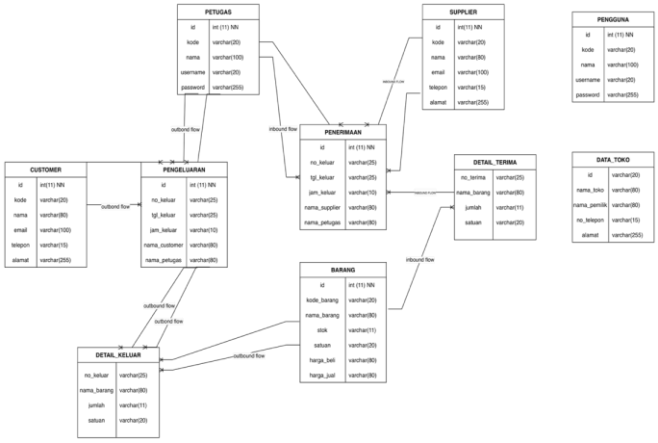

Figure 5*. Entity Relationship Diagram*

The diagram in Figure 5 depicts a system architecture designed for inventory management. This architecture models the workflow of goods movement, which is supported by several master data entities. These master entities include petugas(staff), supplier, customer, and barang (items). The system comprises two primary process flows. The first is the "inbound flow," which represents the process of receiving goods into stock. This process originates from the supplier, with the receiving transaction being recorded by a petugas (staff) in the penerimaan (Receiving) table. Each penerimaan record is subsequently detailed in the detail_terima (Receiving Details) table, which enumerates the specific items received. This inbound flow ultimately updates, or increments, the stock quantity recorded in the barang entity. The second process is the "outbound flow," representing the movement of goods out of the inventory. This flow is initiated by a petugas who

records the transaction in the pengeluaran (Outgoing) table. Each outgoing transaction is linked to the customer receiving the items. Like the inbound flow, each pengeluaran record has associated item details within the detail_keluar (Outgoing Details) table. This outbound flow serves to update (decrement) the stock availability recorded in the barang entity. Thus, the barang entity functions as the central inventory data repository, with its quantity being dynamically managed by these two primary transaction processes.

Implementation

At this stage of the information system implementation, the process of writing program code or coding is carried out. The use of tools begins with the selection of Visual Studio Code as the text editor that facilitates code writing. The author chose the PHP programming language, which simplifies management and is integrated with MySQL as the database management system for data storage. Additionally, HTML, CSS, and JavaScript are used in the system design, along with the Bootstrap framework to accelerate the development of the website's interface with a simpler layout and design. In developing this system, the CodeIgniter method is also utilized as a PHP framework that helps organize the code structure and application management more efficiently, making the development process more streamlined and standardized.

Testing

After the system design was completed, testing was conducted to measure the effectiveness of the system and ensure that all its functions operated according to the initial plan (Muhammad et al., 2023). The Black Box Testing method and the System Usability Scale (SUS) are used to evaluate this web system. The Black Box Testing method uses the system's response to the given input, so the tester does not need to directly know the internal parts of the program (Nur Cholifah & Melati Sagita, 2018) However, the System Usability Scale (SUS) is a way to measure users' ability to use an information system. This method includes a set of questions about usability, with a rating scale from 1 to 5 where 1 indicates disagreement, and 5 indicates complete agreement (Kaban et al., 2020).

Maintenance

Inventory system maintenance is an important process aimed at ensuring the system functions well, accurately, and efficiently in managing stock. The main objective of this maintenance is to ensure the system runs optimally without interruptions, reduce the risk of data errors, and enhance the reliability and security of the system. Maintenance is carried out in several forms, such as preventive maintenance conducted routinely to prevent damage, corrective maintenance to fix errors or bugs that arise, adaptive maintenance that adjusts the system to changes in business needs, and perfective maintenance aimed at improving the system's performance and efficiency. Maintenance is carried out in several forms, such as preventive maintenance conducted regularly to prevent damage, corrective maintenance to fix errors or bugs that arise, adaptive maintenance that adjusts the system to changing business needs, and perfective maintenance aimed at improving the system's performance and efficiency.

RESULT AND DISCUSSION

This study culminates in the development of a web-based stock management platform designed for the Norin store. Authorized personnel, including administrators and staff, can access the system to perform various tasks such as item lookups, reviewing product specifics, handling stock entry, and processing transactions. A key component of the system is a dedicated administrative dashboard, which provides the administrator with centralized control over all product, purchasing, and customer information.

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Login Page

The system implementation begins with the login page, which functions as the authentication gateway for users. As shown in Figure 6, this interface is designed for the Gudang Toko Norin: Sistem Inventori & Manajemen Stok. To access the system, the user must input their "Username" and "Password". A key feature on this page is the "Masuk Sebagai" (Login As) dropdown menu. This menu implements a multi-user login mechanism designed to differentiate access rights. The system can be accessed by two user levels, namely Admin and Petugas (Staff), with each level possessing different authorities after successfully logging in.

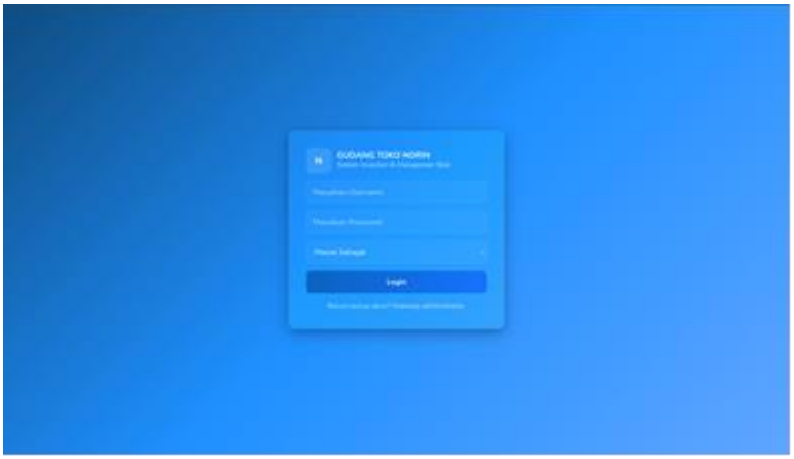

Figure *6. Login Page*

Dashboard Admin Page

Menu page dashboard is the page that is displayed after the admin successfully logs in. This page is the first page that appears after the login process. After the system authenticates the account sent by the user, if successful, the admin will be directed to the menu dashboard. Dashboard displays important information in the form of total data contained in this feature to control data. The appearance of this page can be seen in Figure 7.

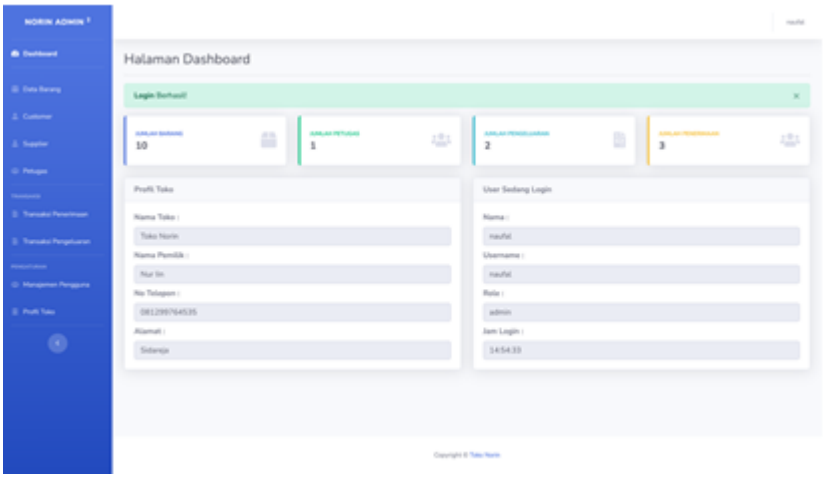

Figure *7. Admin Dashboard Page*

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Data Barang Page

The Item Data module is a core feature for managing the product master. The main page (shown in Figure 9 presents the Item List in a tabular format. This interface displays essential information such as Item Code, Item Name, Stock, Purchase Price, and Selling Price. On this page, the admin can perform full CRUD (Create, Read, Update, Delete) functionalities. This functionality is implemented via the Add button for inputting new data. Furthermore, an Action column is present, which contains buttons to edit (green icon) and delete (red icon) existing item data. When the Admin presses the edit "Aksi" button, the system navigates to the Edit Item page, as seen in Figure 10. This form allows the admin to modify specific details of the selected product, including Item Name, Stock, Unit, Purchase Price, and Selling Price. The changes are validated and saved to the database after the admin presses Save button.

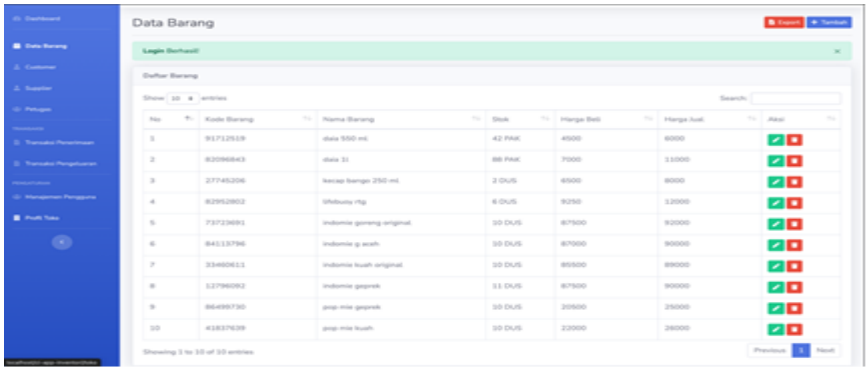

Figure *8. Data Barang Page*

Customer Page

The "Data Customer" module is designed to manage customer information. The main page, shown in Figure 8, presents the "Daftar Customer" in a table. This table displays essential details: "Kode Customer", "Nama Customer", "Telepon", "Email", and "Alamat". The admin has full CRUD (Create, Read, Update, Delete) control on this page, facilitated by the "+ Tambah" and "Export" buttons. An "Aksi" column provides buttons to edit or delete individual customer records. When the Admin clicks the edit icon, the system displays the "Ubah Customer" form, as seen in Figure 8. This form is pre-populated with the selected customer's data, allowing the admin to modify fields such as "Nama", "Email", "Telepon", and "Alamat". Pressing the "Simpan" (Save) button updates the record in the database.

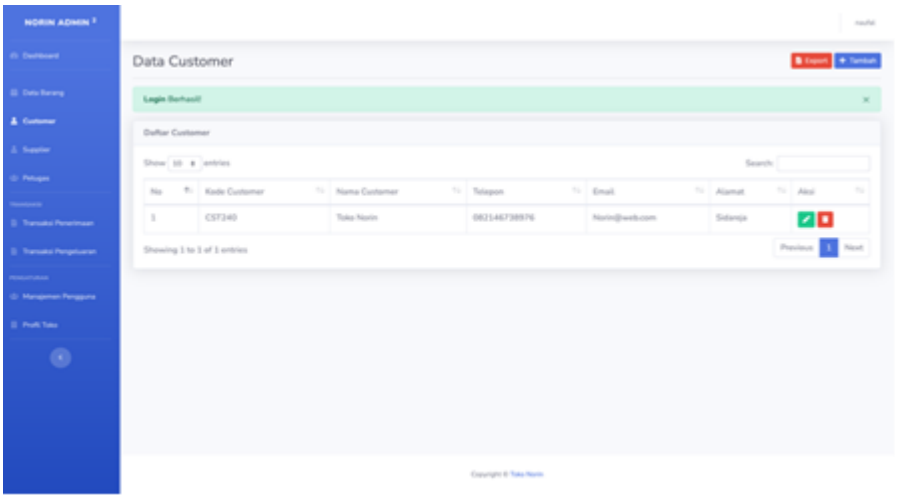

Figure *9. Customer Page*

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Supplier Page

The Data Supplier module allows an Admin to manage supplier information. The main page features a table listing all suppliers and their details, including code, name, phone, email, and address. The admin has full CRUD (Create, Read, Update, Delete) permissions. They can add new suppliers using a Tambah button, download a report with an "Export" button, and edit or delete individual suppliers using buttons in the Action column. Clicking the edit button opens a separate Ubah Supplier form where the admin can update the supplier's details and save the changes.

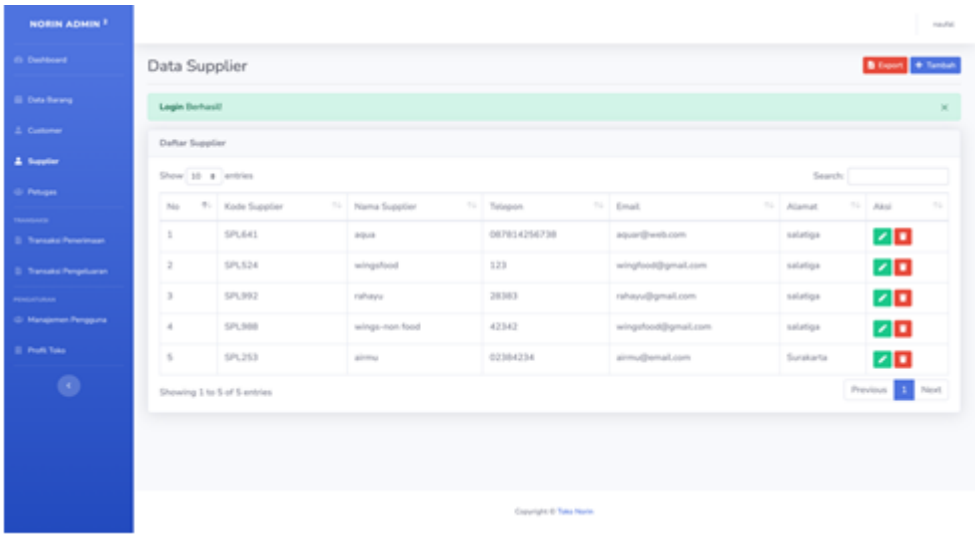

Figure 10. ***Suplier Page***

Data Petugas Page

The "Data Petugas" (Staff Data) module is designed for the admin to manage staff accounts that have access to the system. The main page shown in Figure 11 presents the "Daftar Petugas" (Staff List) in a tabular format. This table displays account details, including "Kode" (Code), "Nama" (Name), "Username", and "Password". The admin has full functionality to add new accounts on admin dashboard.

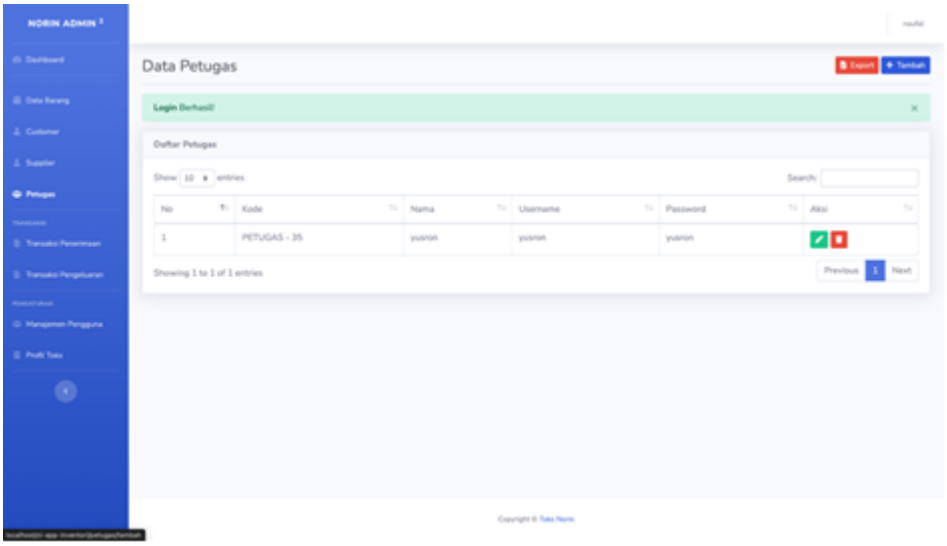

Figure 11. ***Data Petugas Page***

Receiving Transaction Page

The Receiving Transaction module implements the inbound inventory workflow. The main page shown in Figure 12 presents the Receiving List. This page serves as a transaction "header" log,

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displaying summary data for each entry, such as Receiving No, Staff Name who recorded it, Supplier Name, and Date Received. The admin can add a new receiving transaction using the Add button and delete a transaction using the Aksi. To view the itemized details of a transaction, the admin presses the "Aksi" button which navigates to the Receiving Details page shown in Figure 18. This detail page displays summary information at the top like "No Penerimaan" and "Waktu Penerimaan" - Time Received, followed by a table detailing the Item Name and (Quantity) of items received in that specific transaction.

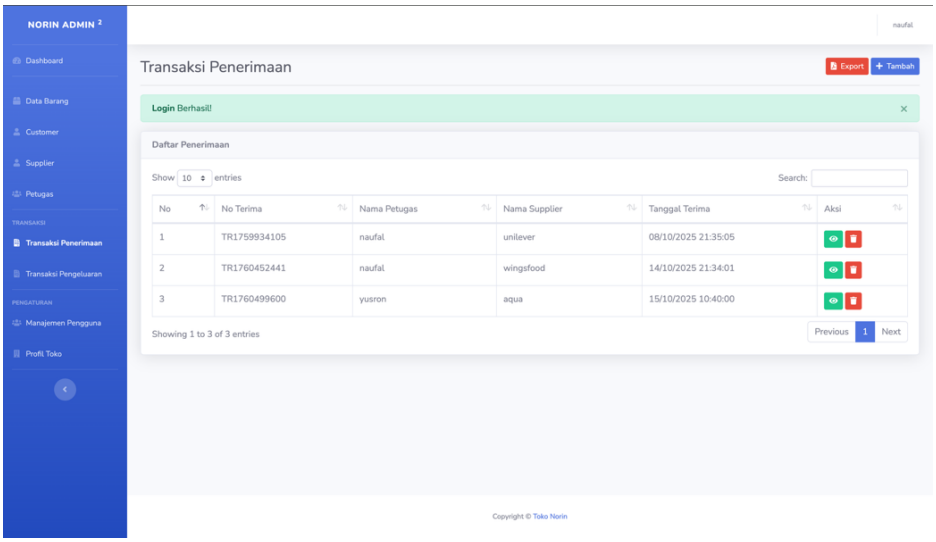

Figure 12. *Receiving Transaction*

User Management Page

The User Management module, located under the Settings menu, is designed to manage accounts that have administrative access to the system. The main page shown in Figure 13 presents the User List. This table displays login details, including Code, Name, Username, and Password. The admin can add new users. Additionally, the Admin can manage existing accounts using the Action buttons. When the Admin clicks the edit button, the system displays Edit User form shown in Figure 13 This page allows the admin to update the Username, , and "Password" for the account. The changes are saved to the database after pressing the Save button.

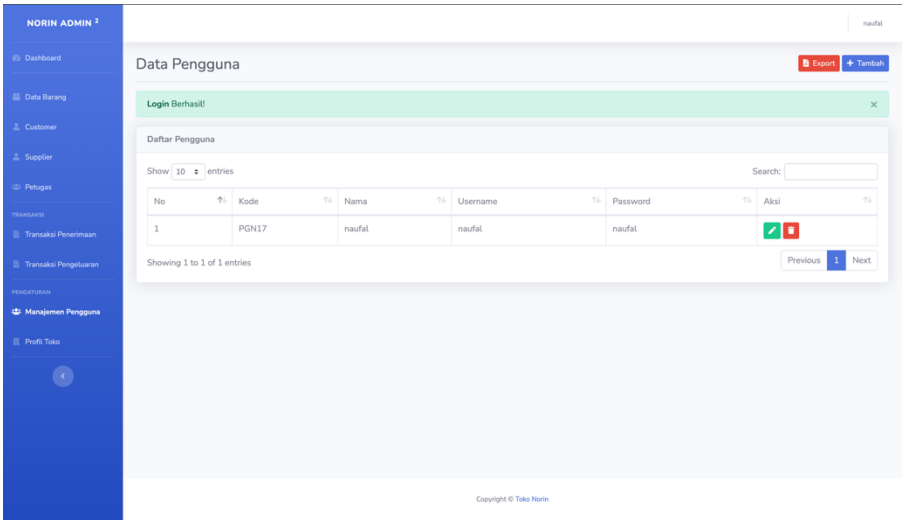

Figure 13. *User Management*

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Functional Result Testing (Black Box Testing)

Black box testing is a method for testing a system that has been designed to ensure whether the system runs according to the expected functionality (Muhammad Mu'tashim Billah; Devi Afriyantari Puspa Putri, 2023) The purpose of this test is to assess whether the system can be categorized as successful or failed based on its ability to carry out the functions that have been designed(Gustinov et al., 2023)This method really helps researchers identify problems with the system, so that these problems can be corrected before the system is used by users. The results of the black box testing are summarized in Table 1, which provides a detailed overview of performance and functionality of the system being tested.

Table 1. ***Black Box Testing***

ID	Module	Test Case	Expected Result	Status
A	**Authentication**			
A-1	Login	Login with valid Admin credentials.	Login succeeds, redirects to Dashboard.	Pass
A-2	Login	Login with invalid credentials.	Error message shown, access denied.	Pass
B	**Master Data (CRUD)**			
B-1	Data Barang (Items)	Create: Add a new item.	Item saves and appears in the list.	Pass
B-2	Data Barang (Items)	**U**pdate: Edit an existing item's name.	The item's name is updated in the list.	Pass
B-3	Data Barang (Items)	**D**elete: Delete an item.	Item is removed from the list.	Pass
B-4	Data Customer	Add a new customer.	Customer saves and appears in the list.	Pass
C	**Core Transactions**			
C-1	Transaksi Penerimaan	Add a new receiving (inbound) transaction.	Transaction saved; item stock increases.	Pass
C-2	Transaksi Pengeluaran	Add an outgoing (outbound) transaction.	Transaction saved; item stock decreases.	Pass
C-3	Transaction Validation	Attempt an outbound transaction for more items than are in stock.	Error message "Insufficient stock" shown; stock level remains unchanged.	Pass
D	**Settings**			
D-1	Profil Toko	Update the store's profile information.	New information is saved.	Pass

Usability System Scale (SUS)

To ensure the website's feasibility, an evaluation was conducted using the System Usability Scale (SUS) approach, which tests the user's comfort level in operating the information system. This testing method involves the implementation of a survey instrument containing ten question items with a range of response options from "Strongly Disagree" to "Strongly Agree". SUS demonstrates a high level of adaptability and effectiveness in its application, this system was tested with 20 respondents, consisting of shop employees and the public including in research with a limited number of 21 respondents (Intyanto et al., 2021). The following table shows the list of questions

used in the SUS testing for this study. This test is a method used to measure the degree of ease or difficulty users experience when interacting with a system. The method consists of 10 questions designed to provide a comprehensive overview of the user's experience with the system under evaluation. Respondents are asked to rate each question on a 1-to-5 scale, where 1 means 'Strongly Disagree' and 5 means 'Strongly Agree'. Each question has a score contribution ranging from 0 to 4. Based on the results of this test, a system is considered 'good' if its overall System Usability Scale (SUS) score is 69.

Table 2

No	Calculated Score (sample data)										total	Value
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		(total x 2.5)
1	4	4	3	3	4	3	3	4	4	3	35	88
2	3	3	4	2	3	2	3	3	3	1	27	68
3	4	1	3	1	3	2	3	2	3	0	22	55
4	4	3	3	2	3	4	4	3	4	3	33	83
5	3	1	3	1	3	1	2	1	3	1	19	48
6	3	1	3	1	3	1	3	1	3	1	20	50
7	2	3	4	3	3	3	3	3	3	3	30	75
8	3	3	3	3	3	3	3	3	3	3	30	75
9	4	0	4	0	4	0	4	0	4	0	20	50
10	4	0	4	1	4	4	4	4	4	0	29	73
11	4	4	4	1	4	4	4	0	4	0	29	73
12	3	3	4	0	3	3	3	1	4	1	25	63
13	3	3	3	1	3	2	3	3	3	1	25	63
14	3	3	3	1	3	3	3	3	3	1	26	65
15	3	3	3	1	3	3	3	3	3	1	26	65
16	4	3	4	3	3	3	2	3	3	1	29	73
17	4	4	4	3	4	3	4	4	3	2	35	88
18	3	3	3	4	4	3	4	4	4	3	35	88
19	3	2	2	3	3	3	3	3	2	1	25	63
20	4	3	4	3	3	3	4	3	3	3	33	83
	Averages score (Last Result)											69

System Usability Scale Assesment

The SUS calculation is performed by subtracting 1 from the score for odd-numbered questions, while for even-numbered questions, the score is subtracted from 5. This method aims to normalize the scores by balancing the positive and negative aspects of the user experience. From the calculation results involving 20 respondents, an average score of is 69. According to the SUS assessment parameters, this score is rated as 'Good', It means Users can get their tasks done, but they likely encounter some points of friction, minor confusion, or inefficiency. They might have to pause and think or use a workaround for a clumsy feature. indicating that this system is acceptable for meeting user needs.

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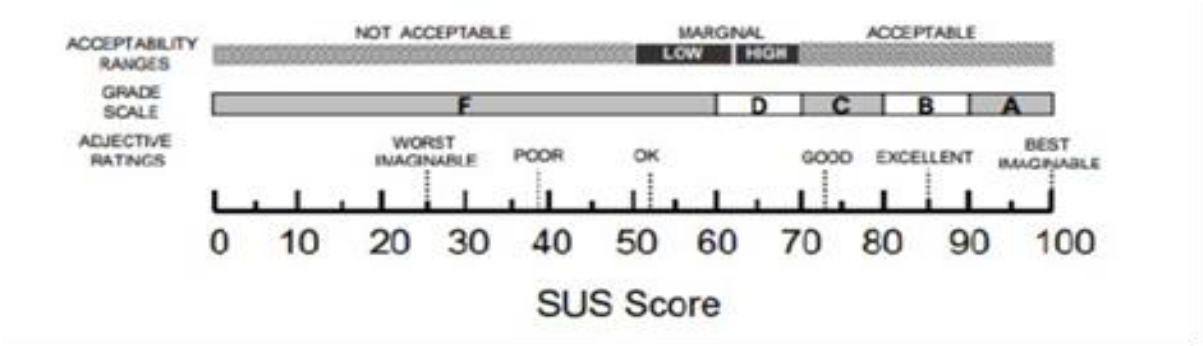
Table 3



CONCLUSION AND SUGGESTIONS

Conclusion

The research process that has been conducted successfully developed a web-based stock management system for the NORIN store. The features of the systems run into adding stock, checking the stock manage the staff also This information system has also undergone testing, through a series of functional tests using the black box testing technique and usability analysis using the System Usability Scale (SUS). In the black box testing, based on the evaluation of the website's functionality, it was confirmed to be working optimally as expected. Meanwhile, in the SUS testing, the system received a final score of 69, which falls into the "Good" category, signifying that it has met the standards of acceptability and ease of operation for its users.

Suggestion

For future research, the Toko Nor'In inventory system can be significantly developed to broaden its scope beyond warehouse management alone. This development should include adding a sales transaction feature (Point of Sales or Cashier) that is directly integrated with automatic stock deduction, alongside financial reporting features such as profit and loss statements. Furthermore, to enhance operational efficiency and staff mobility, the system's interface needs to be made responsive (mobile-friendly) or developed into a dedicated mobile application (Android/iOS). This will enable staff to check stock or input data in real-time directly from the store aisles using only a smartphone or tablet, eliminating the need to use the cashier computer.

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