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## Web-based Inventory System at 24PROJECT Using the Design Thinking Method

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**ABSTRACT**

An effective inventory management system is essential for companies to ensure the availability and accuracy of goods data. 24PROJECT previously used a manual recording method that caused various problems, such as data discrepancies, reporting delays, and potential human error. To overcome these problems, this research aims to design and develop a web-based inventory information system with a Design Thinking approach that focuses on user needs and convenience. The development process is carried out through stages: problem identification, goal setting, literature study, data collection, system analysis, interface design, and system testing. The technologies used in the implementation of this system are Dart, Flutter, and Pocketbase. The results of the research show that the system built is able to record and monitor goods transactions in real-time, present stock and transaction reports accurately, and improve work efficiency and decision making. With a simple, informative, and easy-to-use interface, this system successfully provides an adaptive and effective digital solution for inventory management at 24PROJECT.

***Keywords:***

Inventory system, web-based, Design Thinking, Flutter, efficiency, accuracy.



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## INTRODUCTION

Effective inventory management is a crucial part of today's digital era, and many companies are starting to switch from manual systems to digital systems in order to improve the accuracy, efficiency, and convenience of the inventory data management process[1][2]. 24PROJECT, as an entity that provides services, also faces similar challenges in managing increasingly complex and dynamic inventory data[3][4].

However, the current inventory system at 24PROJECT is still conventional, relying on manual recording or spreadsheets that are prone to human error, delays in data updates, and difficulties in tracking goods in real-time[5]. This causes various problems such as data loss, inaccurate stock, and inefficiency in the decision-making process. Therefore, a solution is

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needed that is able to answer these problems with a user-oriented approach and real needs in the field[6][7].

To address these challenges, this research proposes the development of a web-based inventory system using the Design Thinking approach[8]. The Design Thinking method was chosen because it emphasises a deep understanding of user needs, exploration of creative solutions, and continuous iteration in the product development process. With this approach, the designed system is expected to not only fulfil functional needs, but also provide a better and more efficient user experience[9][10].

The development of this web-based inventory system is expected to help 24PROJECT in recording, monitoring, and managing stock items in an integrated and real-time manner. In addition, the application of the Design Thinking method is also an important contribution in ensuring that the resulting technology solutions are truly relevant and can be effectively adopted by end users[11][12].

**METHODS.**

To give a better understanding of the development process of the inventory information system, the following diagram shows the flow of research steps visually.

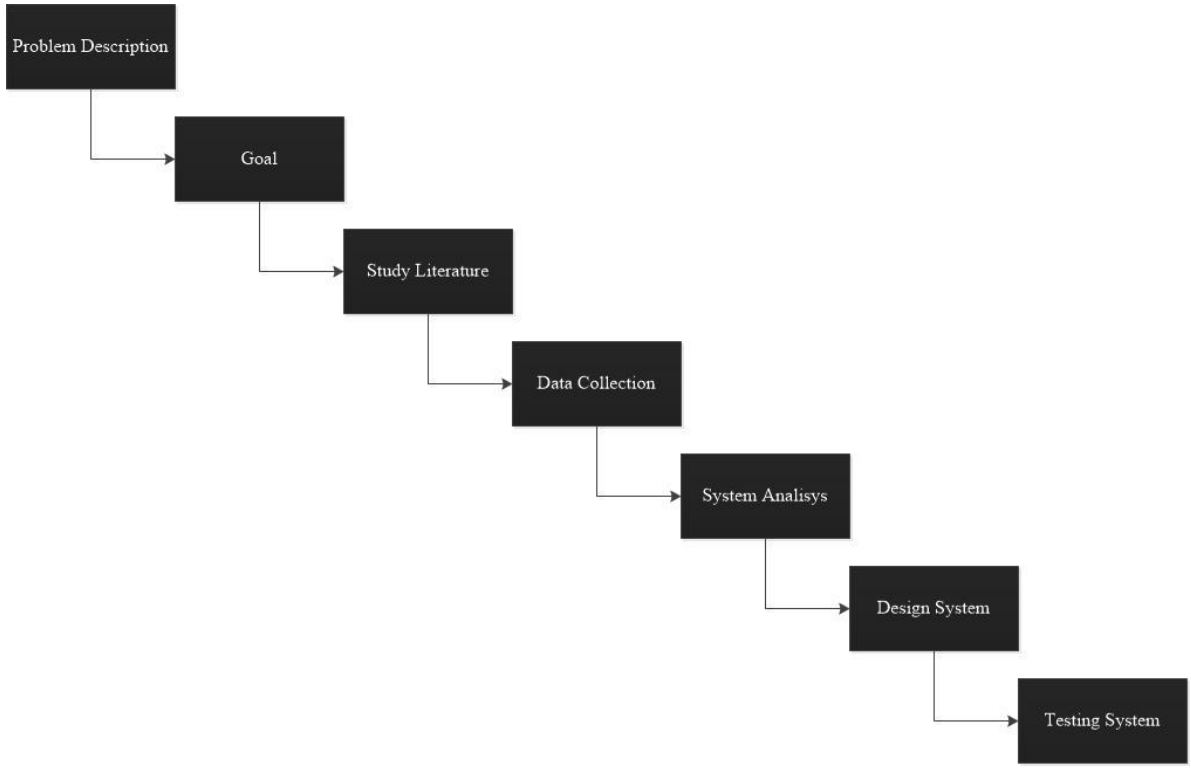


**Figure 1. Research Stage**

The development of a web-based inventory system at 24PROJECT is carried out through stages that follow the Design Thinking method, starting from problem identification (Problem Description) related to inventory management that is still manual and inefficient[7][13]. After that, a goal was set to design a system that was more structured and easy to use. Literature studies were conducted to enrich understanding of similar systems and appropriate methodologies, then continued with data collection through observations and interviews with users in the field[14]. The data obtained was analysed at the System Analysis stage to formulate the right system requirements, then continued with system design (Design System) which pays attention to functional aspects and user interfaces. The

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final stage is Testing System, which is a testing process to ensure the system runs according to user expectations and needs. This whole process reflects the Design Thinking approach that focuses on a deep understanding of users and the development of effective and innovative solutions[15].

## RESULTS AND DISCUSSION

The interface of the web-based inventory system designed for 24PROJECT has a simple yet informative look, making it easier for users to manage and navigate the data. Each element in the system, such as dashboards, item categories, item data, transactions, storage locations, and reports, is structured to reflect the actual workflow in the field. Data visualisation is displayed in tabular form, allowing users to quickly understand stock conditions as well as transaction history. This design emphasises not only functionality, but also user-friendliness, making it suitable for both warehouse operations and company management.

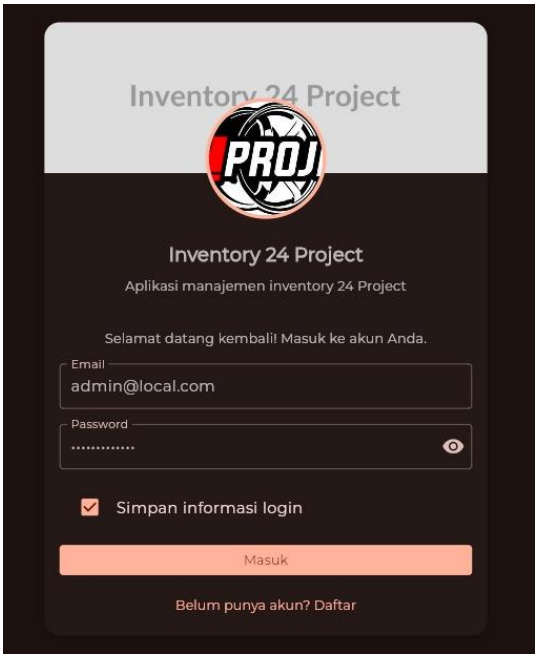


**Figure 2. Authentication Page**

The authentication page in the web-based inventory system developed for 24PROJECT is an important component in ensuring the security of user access to the system. This page is designed as the first step that each user must go through before being able to access various features and important data in the system, such as stock information, transactions, and inventory reports. In its implementation, the authentication page consists of standard elements such as an input form that asks users to enter a username or email address, and a password. After the data is entered and the authentication button is pressed, the system will send the information to the server for credential verification.

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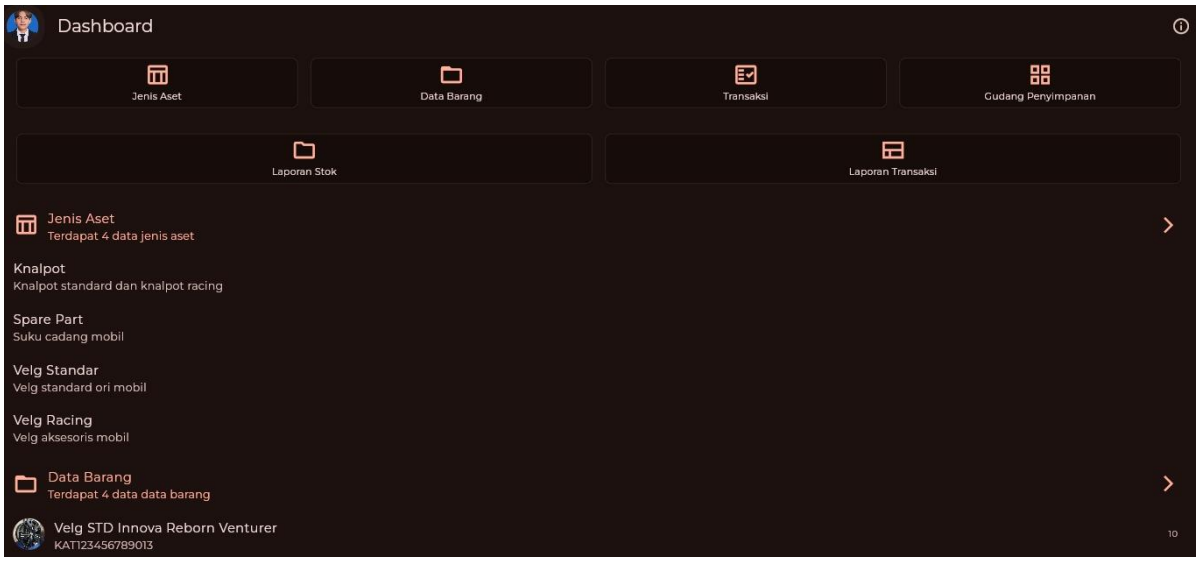


**Figure 3. Dashboard Page**

The Dashboard menu is the main view of the system and serves as a quick way to access important features like Categories, Item Data, Transactions, Locations, Stock Reports, and Transaction Reports. At the bottom of the dashboard is a summary of information from the Category menu, which includes four types of data: exhaust, spare parts, standard wheels, and racing wheels, along with their respective descriptions.


**Figure 4. Category Page Menu**

The category menu in the picture shows a list of item types arranged by function, like exhaust, spare parts, standard wheels, and racing wheels, with their respective descriptions. There is also a search feature at the top to make it easier for users to find certain categories, and there are navigation icons like back, refresh, filter, and add data buttons at the bottom right. This display is organized simply and neatly so that it makes it easier for users to manage category data.

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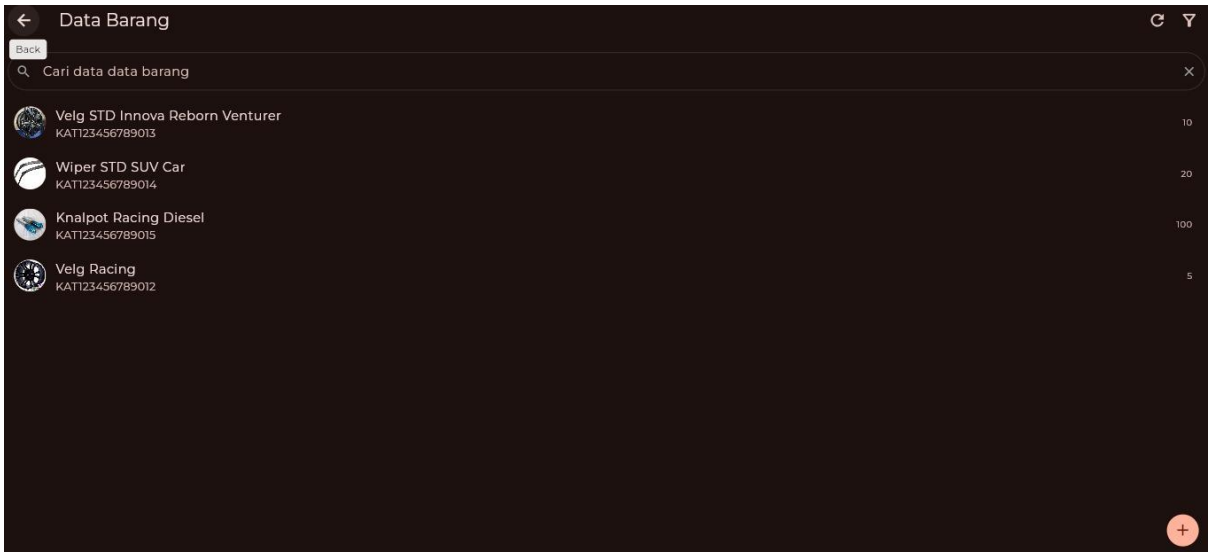


**Figure 5. Item Data Page Menu**

Figure 5 On the right side of the image, the Item Data menu shows a list of all the items that are saved in the system, together with their item name, unique code, and stock quantity. In addition to navigation options like back, refresh, filter, and add data in the lower right corner, there is a search function at the top for convenient data searching. This page functions as a succinct and user-friendly inventory information center since each item input is accompanied by an icon graphic for simple visual identification.

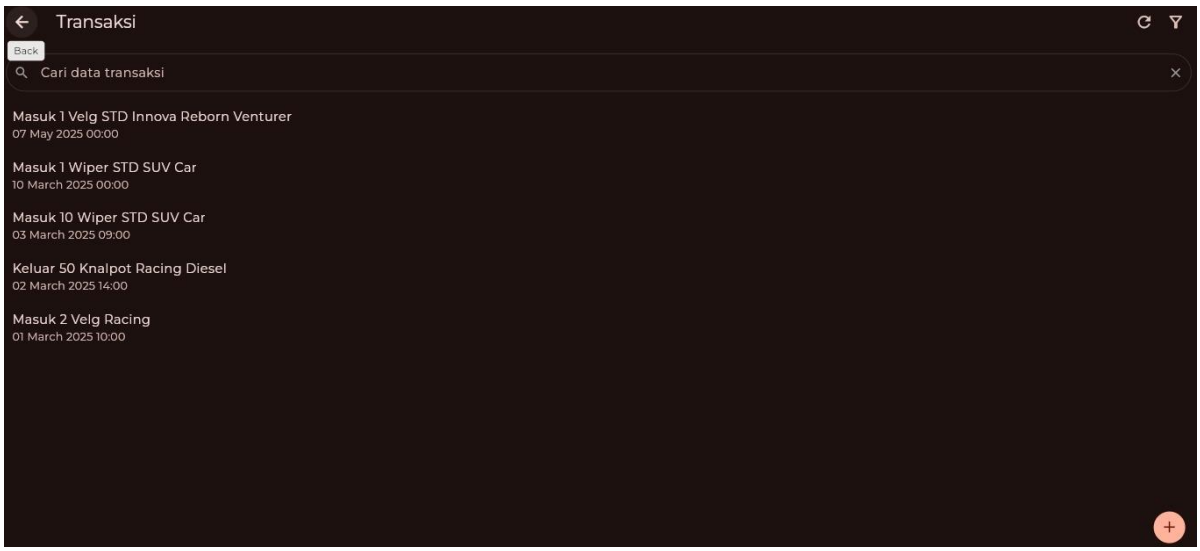


**Figure 6. Transaction Page Menu**

Figure 6 Along with the transaction amount and date, the Transaction menu in the image shows a list of items in and out actions. The item's name, the transaction type (incoming or outgoing), and the execution time are all meticulously documented in each entry. In addition to navigation icons to return to the previous page, refresh the page, filter data, and add new transactions using the button in the lower right corner, there is a search function at the top for convenient tracking of transaction data.

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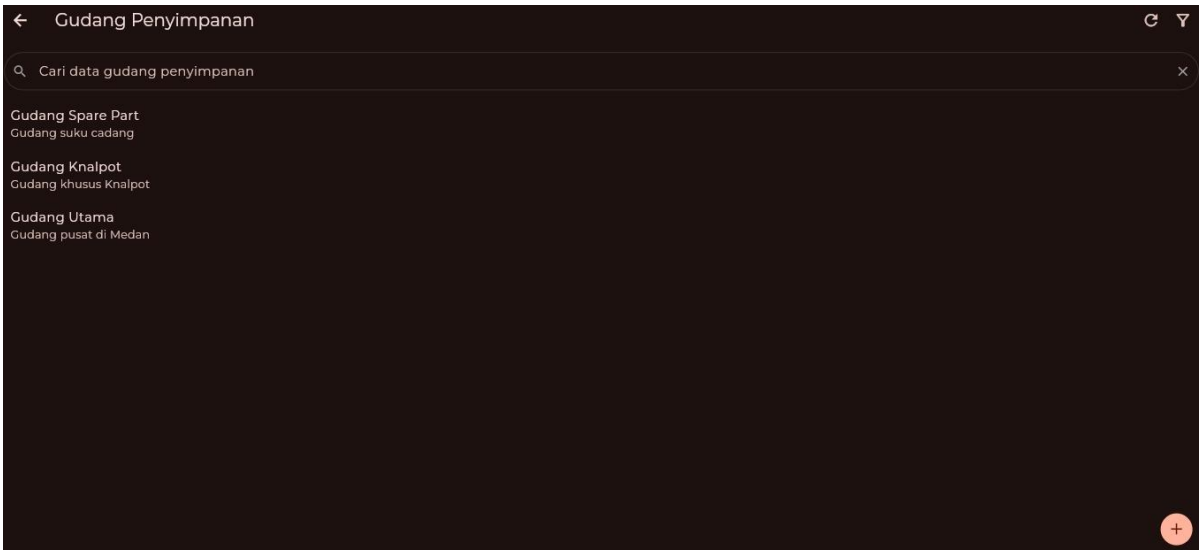


**Figure 7. Location Page Menu**

Figure 7 The storage warehouse menu in the figure shows a list of warehouse-like storage sites together with their names and descriptions of their functions. The Spare Part Warehouse, Exhaust Warehouse, and Main Warehouse in Medan are a few of the locations mentioned. In addition to navigation options to go back, refresh, filter, and add location data in the bottom right corner, there is a search function at the top to make it easier to look for certain areas.


**Figure 8. Stock Report Menu**

Figure 8 The Stock Report menu in the web-based inventory system at 24PROJECT functions as the main feature that provides complete information about the condition of inventory items stored in the system. Through this menu, users can view the current stock quantity of each item, including item category, storage location, and availability status. The stock report is displayed in a structured and easy-to-understand table, making it easier for users to monitor the movement and availability of goods in real-time. The design of this menu was designed with a Design Thinking approach, where user needs are the main focus.

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**Laporan Stok**

| ID | Nama Barang | Nama Kategori | Stok |
|---|---|---|---|
| BRG123456789012 | Velg Racing | Velg Racing | 5 |
| BRG123456789013 | Knalpot Racing Diesel | Knalpot | 100 |
| BRG123456789014 | Wiper STD SUV Car | Spare Part | 20 |

**Figure 9. Stock Report Menu**

The Stock Report menu in 24PROJECT's web-based inventory system is an important feature used to display a comprehensive and detailed inventory report. This feature is designed to assist users in monitoring the condition of stock available at various storage locations, as well as knowing the availability of items based on certain categories such as spare parts, chemicals, or heavy equipment. The report is presented in an informative and easy-to-read table, including data such as item name, current stock quantity, and storage location. In its development, this menu was designed using a Design Thinking approach that focuses on user experience and needs.

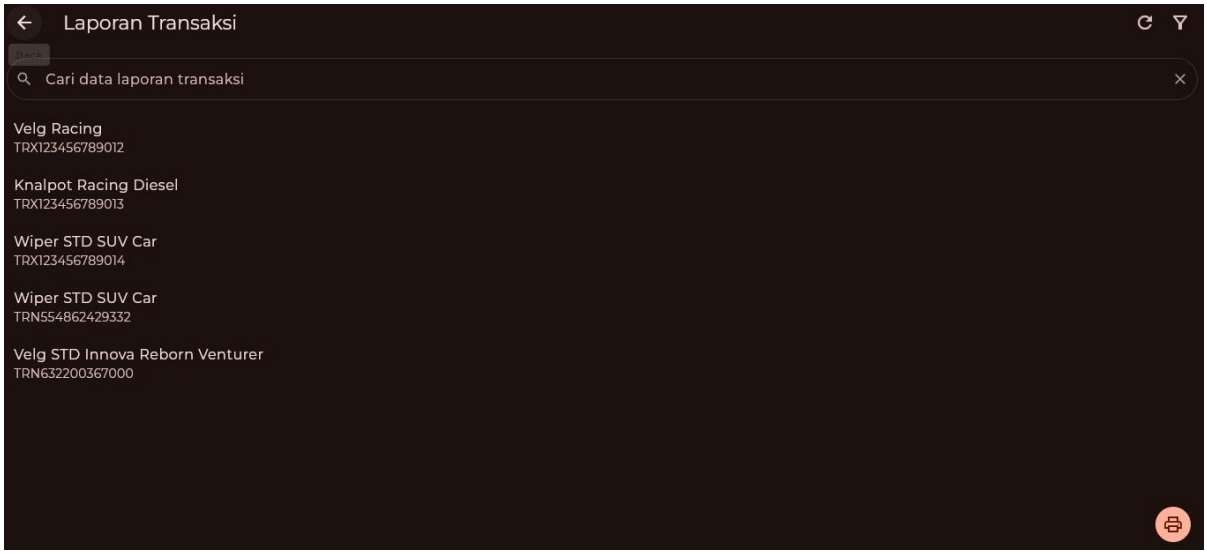


**Figure 10. Menu on the Transaction Report Page**

Figure 10 The Transaction Report menu in the web-based inventory system at 24PROJECT is a feature that presents historical data related to all item transaction activities, both incoming and outgoing stock. This menu is designed to provide transparency and ease in tracking the history of goods movement in the system, including information such as transaction date, transaction type (in or out), item name, quantity, and the user who made the transaction. The data is displayed in a neat and interactive table, so that users can easily trace and understand the flow of goods distribution over time. In its development, the menu was built using a Design Thinking approach to ensure that the interface and functionality truly fit the needs of both field users and management.

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**Figure 11. Menu for the Transaction Report Table Page**

Figure 11 The Transaction Report Table menu on the web-based inventory system at 24PROJECT is a display that presents transaction data in a structured and easy-to-understand table. This page displays a complete history of all activities in and out of the warehouse, including important information such as transaction date, item name, quantity, category, location, and the user who made the transaction. By displaying data chronologically and systematically, this menu makes it easy for users to monitor the movement of goods in real-time or within a certain period. The design of this page was developed using a Design Thinking approach, with the main focus on ease of use and effectiveness in decision-making. Search and filter features are provided to filter data by item category, transaction type, date, or user name, thus speeding up the process of finding the required information. A clean and responsive interface ensures that both warehouse staff and management can access and understand transaction data quickly and accurately.

## CONCLUSION

This research successfully designed and developed a web-based inventory information system for 24PROJECT using a Design Thinking approach that focuses on understanding user needs in depth. This system was built to replace the previously used manual inventory recording process, which often caused various problems such as stock data mismatches, reporting delays, and potential human errors. By utilising Dart, Flutter, and Pocketbase technologies, this system is able to record and monitor incoming and outgoing goods transactions in real-time, present stock and transaction reports accurately, and support the decision-making process quickly and efficiently.

The system development process follows the stages of Design Thinking starting from problem identification, goal setting, literature study, data collection, system analysis, interface design, to system testing. Each feature designed-such as the authentication page, dashboard, categories, item data, transactions, storage locations, stock reports, and transaction reports-was built with a simple, informative, and easy-to-use interface according to the needs of field users and management. Evaluation results show that the system improves operational efficiency, data accuracy, and reduces the manual workload of logistics staff. Thus, this system is an appropriate and applicable digital solution for 24PROJECT in managing inventory in an integrated and modern manner.

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