Design and Implementation of Warehouse Stock Opname System
Case Study : PLTGU Tanjung Uncang

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Abstract
This study aims to design and implement a web-based stock opname system to enhance warehouse management efficiency at The Gas and Steam Power Plant (PLTGU) Tanjung Uncang. The system was developed to address limitations in manual inventory recording, which is prone to errors and lacks real-time data accessibility. The development process followed a structured approach using the Waterfall methodology, encompassing requirement analysis, system design, implementation, system integration and testing, and maintenance. The effectiveness of the system was evaluated using a descriptive quantitative approach through the User Acceptance Testing (UAT) method, involving ten users directly engaged in warehouse management activities. Four key aspects were assessed: system functionality, performance, user interface, and operational efficiency. The evaluation results indicate that all indicators scored above 80%, reflecting a high level of user acceptance and demonstrating the system's effectiveness in supporting warehouse operations. This implementation represents a strategic move toward digital transformation in logistics within the energy sector and has potential for replication in other operational units.

Keywords: Stock-Taking System, Warehouse Management, Logistic Digitalization, User Acceptance Testing (UAT)

1 Introduction

In the highly competitive energy industry, effective warehouse management is a crucial factor in ensuring the smooth operation of the company. The warehouse plays an important role as a place to store raw materials and finished products, which aims to maintain the quality of goods, but also to facilitate the process of recording and systematically retrieving goods. [1]. Good warehouse management not only maintains the quality and availability of goods, but also simplifies the process of recording and taking goods so that it has a direct impact on the smooth running of the company's operational activities. On the other hand, inaccurate inventory management can cause various obstacles such as excess or lack of stock, recording errors, and not having real-time inventory data which ultimately disrupts overall work efficiency [2]. The Gas and Steam Power Plant (PLTGU) Tanjung Uncang requires accurate stock management to ensure the continuity of its operations. At present, the stock recording process is still done manually using hanging cards and Microsoft Excel, which is prone to human error and is unable to present data in real-time. The warehouse at PLTGU Tanjung Uncang stores a wide range of items, including mechanical and electrical components, chemicals, and spare parts. Therefore, an integrated information system is needed that is able to monitor the availability of goods in real-time and in accordance with the logistics needs in the power plant environment.

Several previous studies have developed website-based stock taking systems to improve the accuracy and efficiency of inventory management [3–5]. However, the system has not been fully adapted to the specific operational and logistical needs of a power plant warehouse such as those at PLTGU Tanjung Uncang. This study aims to design and implement a digital-based stock opname system to accelerate the recording process, strengthen stock control, and provide accurate inventory information. The digitalization initiative is expected to enhance warehouse management efficiency and accelerate the decision-making process related to logistics [6]. This research focuses on the implementation of a system that is specifically tailored to the characteristics and needs of the warehouse at PLTGU Tanjung Uncang as an effort to overcome the limitations of the previous system.

The evaluation of the system was conducted using quantitative descriptive approach through the User Acceptance Testing (UAT) method, which measures the level of user acceptance based on functional aspects, system performance, interface design and user experience, and operational efficiency [7]. The evaluation was conducted by distributing a Likert Scale questionnaire to system users to measure the level of acceptance regarding system functionality, system performance, interface experience and operational efficiency. The results of this questionnaire served as the basis for analyzing the extent to which the system can be accepted and optimally utilized by users in supporting warehouse operational activities [8].

2 Literature Review

2.1 Warehouse

A warehouse is a facility used to store various types of goods, from raw materials, goods in process, to finished products. The term warehousing refers to all activities related to the management and operation of a warehouse [9]. In addition to ensuring that goods are maintained according to established standards, warehouses also play a vital role in the smooth flow of logistics through organized inventory recording and control [10].

2.2 Warehouse Management System

A warehouse management system is designed to optimize the process of receiving, storing, picking, and issuing goods. It enables effective stock control, goods tracking, and space utilization. The implementation of a warehouse management system contributes to increased operational efficiency and supports decision-making processes through real-time data-driven insight [2].

2.3 Inventory Management System

Inventory Management System is an information system that functions to organize and manage transactions of goods in and out of a warehouse. This system is closely related to recording stock transactions in real-time ensuring a balance between demand and availability of goods. Through this system, companies can monitor the movement of goods in a structured manner, thereby supporting logistics operational activities [11].

2.4 Stock Opname

Stock opname is the process of periodically counting physical inventory to ensure alignment between actual data and administrative records. This process is essential for identifying discrepancies, such as recording errors and inventory losses to optimize stock management [12].

2.5 Website-Based Stock Opname System Design

Stock opname is the process of physically verifying the quantity of goods to ensure that the data recorded in the system matches the physical conditions in the warehouse. If this activity is still conducted manually, it has the potential to cause recording errors, inaccurate stock information, and delays in stock recording. Therefore, it is essential to develop a website-based application that facilitates an efficient stock opname process and enables all inventory-related information to be recorded and stored centrally within

an integrated database system [13]. Furthermore, web-based system enhances data integration across different units and enables real-time inventory monitoring, which is critically important for effective warehouse operations [14].
In system design, the stock opname website was developed using an integrated approach, that incorporates key features such as goods data management, recording incoming and outgoing goods transactions, and inventory reporting. The user interface is designed to be simple and responsive, aiming to enhance usability and facilitate ease of operation for warehouse personnel.
The development of this system follows the Waterfall methodology. This method employs a sequential workflow, starting from requirement analysis, system design, implementation, system integration and testing, to the maintenance system [15]. Each phase needs to be completed thoroughly before proceeding to the next. This method is considered suitable for the development of a stock opname system, as user requirements were clearly defined from the outset, allowing for a well-structured and systematic design process.
By implementing this system, improvement in stock recording accuracy is expected, thereby supporting the effectiveness of warehouse management. The success of the system will be evaluated using the User Acceptance Testing (UAT) method, with key indicators including system functionality, performance, user interface quality, and operational effectiveness and productivity.

2.6 User Acceptance Testing (UAT)

User Acceptance Testing (UAT) is a testing phase that involves end users to assess whether the system meets the established operational needs and standards [7]. This testing is conducted by users who are directly engaged with the system in real operational settings. The primary objective is to ensure that the system meets technical specifications while effectively supporting end-user workflows. The outcomes of User Acceptance Testing (UAT) are essential in determining whether the system is fit for operational deployment within the intended work environment [8].

3 Research Methode

This study employs a descriptive quantitative approach. This approach was chosen to describe systematically, objectively, and accurately the implementation of a website-based stock opname system at the PLTGU Tanjung Uncang warehouse, as well as to measure the level of user acceptance of the system. The focus lies in the collection and analysis of numerical data obtained through a structured questionnaire, designed to assess the extent to which the system supports the effectiveness of warehouse management. Descriptive quantitative data analysis methods are used to present results in the form of averages and percentages, allowing the researchers to identify fundamental patterns and characteristics within the collected data [16].
Data collection was conducted using a closed-ended questionnaire based on a five-point Likert Scale. The instrument was developed according to four key indicators from the User Acceptance Testing (UAT) method: system functionality, system performance,

interface design, and operational efficiency. The acceptance test involved 10 respondents who were asked to rate each statement from 1 (Strongly Disagree) to 5 (Strongly Agree).
Respondents were selected purposively, considering the limited scope of the system's use, which applies only to certain operational units. Therefore, the participants included only those directly involved in inventory activities such as warehouse staff, operational employees, and management personnel responsible for inventory monitoring and decision-making.
The data were analyzed using a descriptive quantitative approach, involving the calculation of average scores and percentages for each indicator. The results of this analysis provide an overview of the level of user acceptance of the website-based stock opname system, as well as its contribution to improving warehouse operations at PLTGU Tanjung Uncang.

4 Result and Discussion

This chapter presents the results of the design and implementation of a website-based stock opname system at the PLTGU Tanjung Uncang warehouse. The discussion focuses on four main aspects: system design, implementation in warehouse operations, user acceptance assessment through the User Acceptance Testing (UAT) method, and system evaluation based on user perceptions of the system's functionality, performance, interface, and operational efficiency.

User Acceptance Testing (UAT) is conducted to evaluate the extent to which the system is accepted and can be used effectively by end-users. The testing was conducted by providing direct access to warehouse staff and relevant stakeholders to operate the developed system, followed by the completion of a Likert scale questionnaire. The assessment is based on four key indicators: system functionality, performance, ease of use, and effectiveness in supporting work productivity.

4.1 Website Design

To ensure that the system development process follows a structured approach, the website-based stock opname system was designed using the Waterfall methodology [17]. The system design involves the following sequential stage:

a. Requirements Analysis

The design of a website-based stock opname system at the PLTGU Tanjung Uncang warehouse began with a requirement analysis, which was conducted through in-depth interviews with warehouse staff and relevant management personnel. This approach aimed to determine user expectations and to understand the existing problems and operational needs of the stock recording system in the field. The information gathered served as the foundation for designing system features and workflows that align with the actual conditions of the warehouse.

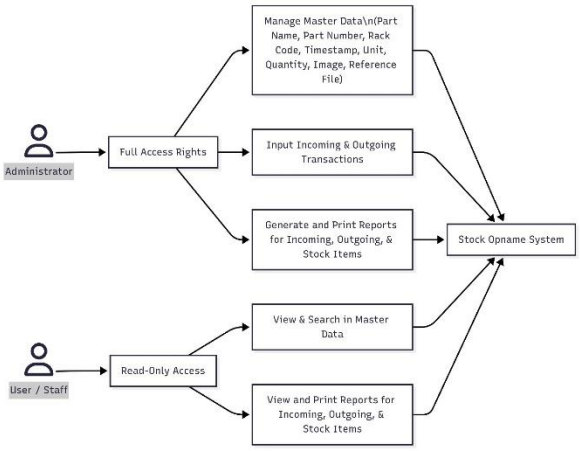

Fig. 1. Use Case Diagram

Figure 1 presents the Use Case Diagram of a website-based stock opname system implemented in the PLTGU Tanjung Uncang warehouse. This diagram illustrates the two user roles: Administrator and Staff/User. The administrator holds full access rights, including managing master data, record incoming and outgoing goods transactions, and generating stock reports. Meanwhile, Staff only have access to view and print report data. All of these processes are integrated in a stock opname system, which is designed to support efficient and accurate stock management.

b. Design System

System design is carried out based on requirements identified in earlier stage. The main focus of this phase is to create an efficient system structure and workflow that ensure ease of use for warehouse personnel. This design process includes determining the main functions, user interface design, and establishing data structures that support the digitalization of the stock opname process. This design serves as the foundation for system development, ensuring alignment with operational goals and user needs.

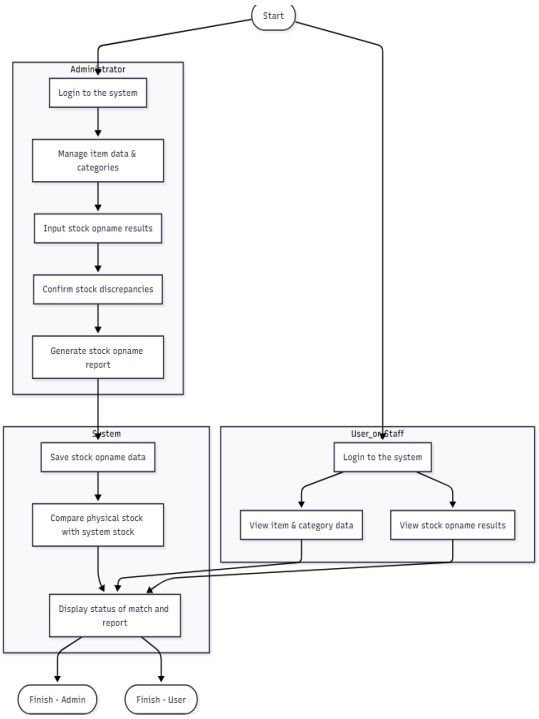

Fig. 2. Activity Diagram of Stock Opname System

Figure 2 presents the Activity Diagram of Stock Opname System, which illustrates the main workflow within the system. It represents the sequence of interaction between users and the system during the implementation of the stock opname process. This diagram serves to map out the logical flow of activities, providing a structured reference for the development of system features.

Fig. 3. Entity Relationship Diagram

Figure 3 presents an Entity Relationship Diagram (ERD), which visualizes the structural design of the inventory system based on user roles. The diagram outlines several key entities, such as users, item data, transactions, and reports, which are interconnected in supporting the integrated inventory management process. The relationships between entities reflect the flow of recording incoming and outgoing goods, as well as automation of preparing stock reports. This database design enables the system to monitor logistics activities accurately and in real time, from receiving goods to the final inventory status.

c. Implementation

The system implementation is carried out by developing a website-based application using the Laravel framework. This stage includes the development of core features such as goods data management, recording stock opname results, and automatic generation of inventory reports. The system was designed with a responsive and user-friendly interface to improve the efficiency and accuracy of stock recording. Further details regarding the implementation result and utilization of the system in the operational environment in the following discussion below.

d. Integration and Testing

Before the system is fully deployed in warehouse operations, an integration and testing phase is conducted to ensure that all functions operate in accordance with user requirement. The testing focuses on data accuracy, system performance, and ease of use using the Black Box Testing method, which is an approach that evaluates system output based on user input without examining the internal code structure. This testing covers key features such as login, goods data management, incoming and outgoing goods transactions, stock opname, and automatic report generation.

Table 1. Black Box Testing

No	Feature Name	Tested Input	Testing Steps	Expected Output	Result / Status
1	Login	Valid username & password	Enter username & password → click login	Dashboard displayed according to user role	Successful
2	Input Item Data	Name, item code, category	Fill in add item form → click save	Data appears in the item table	Successful
3	Incoming Items	Select item, quantity, date	Fill in incoming transaction form → click save	Item stock increases according to incoming quantity	Successful
4	Outgoing Items	Select item, quantity	Fill in outgoing item form → click save	Item stock decreases according to outgoing quantity	Successful
5	Print Incoming Report	Start date and end date	Filter incoming report → click display	Report appears according to filter and can be downloaded as PDF	Successful
6	Print Outgoing Report	Start date and end date	Filter outgoing report → click display	Report appears according to filter and can be downloaded as PDF	Successful
7	Print Stock Report	Start date and end date	Filter stock report → click display	Report appears according to filter and can be downloaded as PDF	Successful

8	Logout	Click logout button	Click logout button on dashboard	System returns to the login page	Successful

Based on the test results, the system was able to process each input and generate the corresponding output, indicating that it met the success criteria for the functional aspect. After the system was deployed and operated by warehouse staff, further evaluation was conducted using the User Acceptance Test (UAT) method as an evaluation of the level of user acceptance. Feedback obtained from users served as the basis for refining the system, while the results of the UAT evaluation are discussed detail in the next sub discussion

e. Maintenance

After the system is implemented, the maintenance phase is conducted periodically. This activity includes bug fixing, data updates, and feature adjustments based on user needs to ensure that the system remains relevant and operates optimally in the long term.

4.2 Implementation of System

Implementation is the process of deploying a system that has been designed and developed to support warehouse management activities at PLTGU Tanjung Uncang. The goal is to ensure that the system operates in accordance with the defined specifications and effectively addresses operational needs in efficient manner. The following section presents the user interface of the implemented stock opname system, as part of the initiative to digitize the warehouse stock opname process at PLTGU Tanjung Uncang.

1. Login Page

The Login page serves as the entry point to the system, requiring users to enter a valid username and password. This feature ensures that only authorized and registered users can access the system dashboard, thereby maintain data security and restrict access.

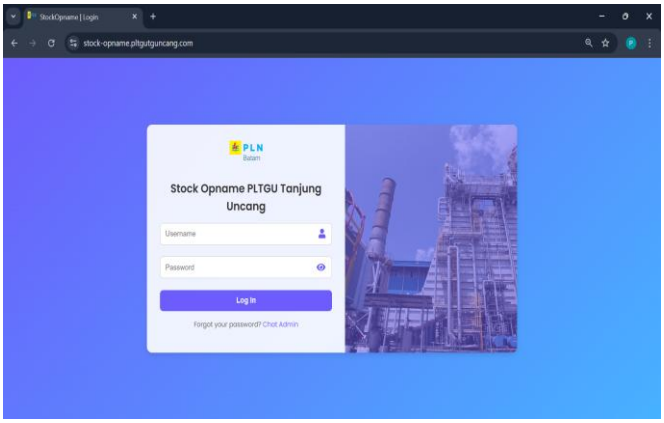

Fig. 4. Login Page Interface

2. Dashboard Page

The dashboard functions as a centralized information hub that presents key warehouse data in real time. It displayed summaries of incoming goods, outgoing goods, and final stock categorized by item type, including electrical, mechanical, and chemical components. This feature enables users to monitor warehouse conditions quickly and efficiently, supporting informed decision-making in stock management.

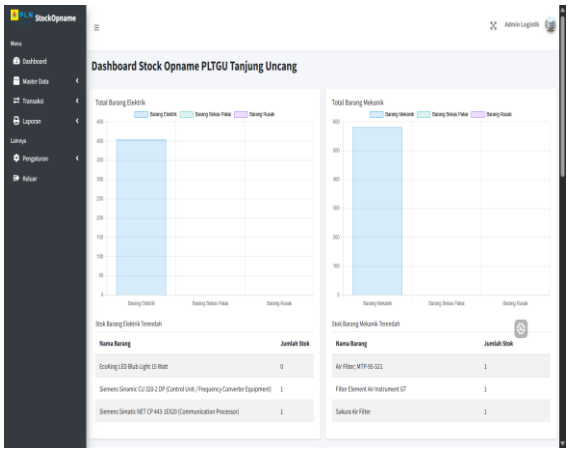

Fig. 5. Dashboard Page Interface of Stock Opname System

3. Master Data Management Page

This page is used to manage item data available in the warehouse. Users can add detailed information about each item and categorize them into three main groups: electrical, mechanical, and chemical. Each category is supported by its own sub-page to ensure the data is well-structured and easily accessible when needed.

Fig. 6. Master Data Management Display

4. Incoming/Outgoing Goods Transaction Pages.

This page consists of two sections: goods-in transactions and goods-out transactions. Each section provides an input form that includes essential information such as transaction date, item name, quantity, and any additional notes. These transaction records serve as the basis for automatic stock updates in the system.

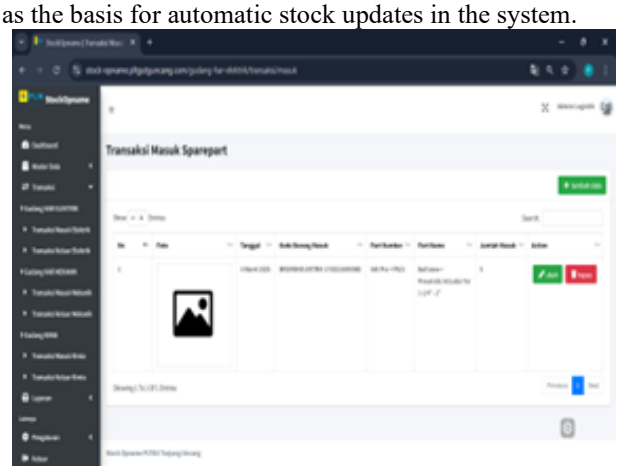

Fig. 7. Data Entry Page for Incoming Goods

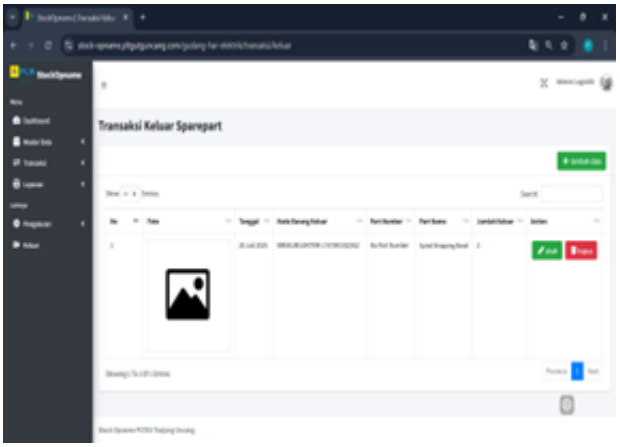

Fig. 8. Data Entry Page for Outgoing Goods

5. Report Page

This page allows users to view and print reports based on goods transaction data. The reports are categorized into three types: incoming goods, outgoing goods, and final stock. The system also provides a filter feature based on time period and goods category, making it easier for users to evaluate stock movements and support decision-making processes.

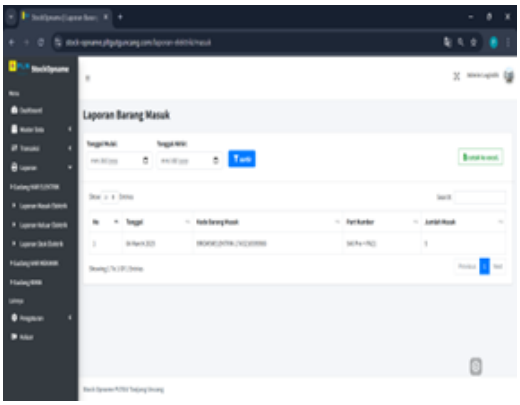

Fig. 9. Incoming Goods Report

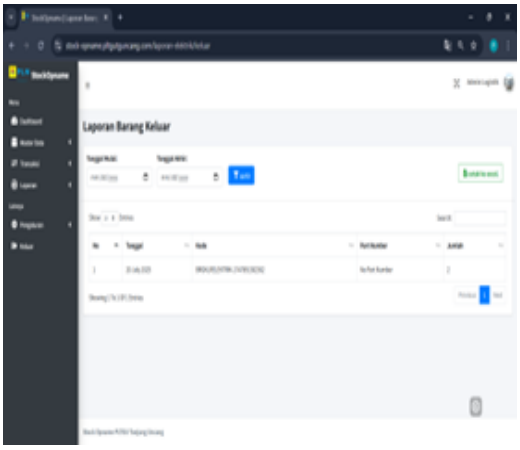

Fig. 10. Outgoing Goods Report

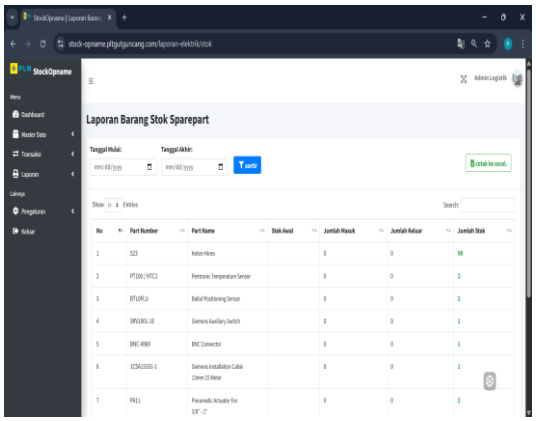

Fig. 11. Final Stock Report

4.3 System Feasibility Evaluation Using the User Acceptance Testing (UAT) Method

System testing was conducted using the User Acceptance Testing (UAT) method that directly involved end-users, namely warehouse officers, employees and management of PLTGU Tanjung Uncang. The objective was to evaluate the level of acceptance of the developed system based on user perceptions and experiences of system performance in an actual operational environment. The UAT testing was conducted with 10 respondents who were asked to fill out a questionnaire using a Likert Scale of 1-5, with the following weighting criteria:

Table 2. Criteria for Likert Scale Assessment

Scale	Description
1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

The following table presents a list of questionnaire evaluation items that cover four test variables, namely: (1) System Functionality, (2) System Performance, (3) Interface Experience and Appearance, and (4) System Usage Efficiency and Productivity. These four aspects are designed to provide a comprehensive evaluation of system quality from a user perspective and serve as the basis for evaluating the feasibility of implementing a website-based stock opname system.

Table 3. List of Questionnaire Items

No	Variable	Question	(P)
1	**System Functionality Evaluation**	The system allows me to record incoming and outgoing goods more accurately than the manual method.	A1
2		The system displays real-time and up-to-date stock information.	A2
3		The system generates up-to-date goods report information.	A3
4		I can easily search and find specific data in the system as needed.	A4
5		The available features in the system are relevant and suitable for my job responsibilities.	A5
6		The process of inputting incoming and outgoing goods data runs smoothly without any issues.	A6
7	**System Performance Evaluation**	The stock opname system can be accessed quickly without long loading times.	B1
8		The system rarely experiences errors or technical issues during use.	B2
9		The system responds quickly to user	B3

		commands (such as data input).	
10		No bugs or missing/unreadable data were found during usage.	B4
11	**System Experience & Interface Display Evaluation**	The system interface is easy to understand for new users.	C1
12		The information displayed on the system pages is well-organized and easily readable according to user needs.	C2
13		Navigation between pages/functions in the system is easy to understand.	C3
14		The system's visual design supports user comfort during use.	C4
15		The layout of menus and buttons in the system aligns with user needs.	C5
16	**System Efficiency & Productivity Evaluation**	The system helps accelerate the stock opname process compared to the manual method.	D1
17		Using the system reduces errors in stock recording.	D2
18		I feel my work has become more efficient since using this system.	D3
19		The system helps me generate reports and stock recaps more easily.	D4
20		The system has a positive impact on the overall smooth operation of the warehouse.	D5

4.3.1 User Acceptance Testing (UAT) Result

The data obtained from the distribute questionnaires were categorized according to the predetermined evaluation variables. Each response was analyzed by calculating the average value based on each question, using the Likert scale as a weighting reference. The calculation was perform by multiplying the number of respondents for each answer choice by the appropriate scale weight [7]. The results of these calculation for each response are presented as follows:

a. Variable 1: System Functionality Evaluation.

This table presents the results of the evaluation of the system functionality aspects based on respondents responses to six questions (A1–A6). The columns in the table display the total score for each item, calculated using the weighted values assigned to each Likert scale choice. These scores are then used to calculate the percentages and averages values, which are summarized in Table 9.

Table 4. System Functionality Evaluation.

P	SS x (5)	S x (4)	N x (3)	KS x (2)	STS x (1)	Total
A1	3 x 5 = 15	7 x 4 = 28	0 x 3 = 0	0 x 2 = 0	0 x 1 = 0	43
A2	1 x 5 = 5	8 x 4 = 32	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	40
A3	1 x 5 = 5	9 x 4 = 36	0 x 3 = 0	0 x 2 = 0	0 x 1 = 0	41
A4	4 x 5 = 20	6 x 4 =24	0 x 3 = 0	0 x 2 = 0	0 x 1 = 0	44
A5	1 x 5 = 5	8 x 4 = 32	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	40
A6	3 x 5 = 15	5 x 4 = 20	2 x 3 = 6	0 x 2 = 0	0 x 1 = 0	41

b. Variable 2: System Performance Evaluation.

This table presents the results of the evaluation of the system performance evaluation aspects based on respondents responses for four questions (B1–B4). The columns in the table display the total score for each item, calculated using the weighted values assigned to each Likert scale choice. These scores are then used to calculate the percentages and averages values, which are summarized in Table 10.

Table 5. System Performance Evaluation

P	SS x (5)	S x (4)	N x (3)	KS x (2)	STS x (1)	Total
B1	3 x 5 = 15	6 x 4 =24	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	42
B2	2 x 5 = 10	6 x 4 =24	2 x 3 = 6	0 x 2 = 0	0 x 1 = 0	40
B3	5 x 5 = 25	5 x 4 = 20	0 x 3 = 0	0 x 2 = 0	0 x 1 = 0	45
B4	0 x 5 = 0	8 x 4 = 32	2 x 3 = 6	0 x 2 = 0	0 x 1 = 0	38

c. Variable 3: Evaluation of System Experience and Interface Display.

This table presents the results of the evaluation on the system experience and interface display aspect, based on respondents responses for five questions (C1–C5). The columns in the table display the total score for each item, calculated using the weighted values assigned to each Likert scale responses. These scores are then used to calculate the percentages and average values, which are summarized in Table 11.

Table 6. Evaluation of System Experience and Interface Display.

P	SS x (5)	S x (4)	N x (3)	KS x (2)	STS x (1)	Total
C1	2 x 5 = 10	8 x 4 = 32	0 x 3 = 0	0 x 2 = 0	0 x 1 = 0	42
C2	3 x 5 = 15	7 x 4 = 28	0 x 3 = 0	0 x 2 = 0	0 x 1 = 0	43
C3	2 x 5 = 10	7 x 4 = 28	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	41
C4	2 x 5 = 10	7 x 4 = 28	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	41
C5	3 x 5 = 15	6 x 4 =24	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	42

d. Variable 4: Efficiency & Productivity Evaluation.

This table presents the results of the evaluation of the efficiency and productivity aspects of the system based on respondents' responses for five questions (D1–D5). The columns in the table display the total score for each item, calculated using the weighted values assigned to each Likert scale response. These scores are then used to calculate the percentages and averages values, which are summarized in Table 12.

Table 7. Efficiency and Productivity Evaluation

P	SS x (5)	S x (4)	N x (3)	KS x (2)	STS x (1)	Total
D1	2 x 5 = 10	8 x 4 = 32	0 x 3 = 0	0 x 2 = 0	0 x 1 = 0	42
D2	3 x 5 = 15	5 x 4 = 20	2 x 3 = 6	0 x 2 = 0	0 x 1 = 0	41
D3	4 x 5 = 20	5 x 4 = 20	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	43
D4	4 x 5 = 20	6 x 4 =24	0 x 3 = 0	0 x 2 = 0	0 x 1 = 0	44
D5	4 x 5 = 20	5 x 4 = 20	1 x 3 = 3	0 x 2 = 0	0 x 1 = 0	43

4.3.2 Score Interpretation

After obtaining the score from the questionnaire results calculated by multiplying the number of responses by the corresponding weight values, the next step is to determine the precentage score for each evaluation. These percentage are then used to interpretation the level of system acceptence by users based on each indicator tested [18]. The score interpretation criteria will be explained as follows: :

Table 8. Score Interpretation

Percentage	Description
0% – 20%	Very Poor
21% – 40%	Poor
41% – 60%	Fair
61% – 80%	Good
81% – 100%	Very Good

Then the final result of the total of each question is used as a reference to calculate the average and percentage values, which serve to measure the feasibility level of the system using the following formula:

$$Mean = \frac{Total\ Weight\ Score}{Number\ of\ Respondent} \quad (1)$$

$$Persentase = \frac{Mean}{Max\ Likert\ Score} \times 100\% \quad (2)$$

A. System Functionality Evaluation.

Table 9. System Functionality Evaluation.

P	Mean Score	Precentage Score	Average
A1	43/10 = 4.3	4.3/5 x 100% = 86%	83%
A2	40/10 = 4.0	4.0/5 x 100% = 80%	
A3	41/10 = 4.1	4.1/5 x 100% = 82%	
A4	44/10 = 4.4	4.4/5 x 100% = 88%	
A5	40/10 = 4.0	4.0/5 x 100% = 80%	
A6	41/10 = 4.1	4.1/5 x 100% = 82%	

Based on the evaluation results, the average percentage score for the system functionality variable reached 83%. The result demonstrates that each component and feature complies with the design specifications while effectively addressing user requirements.

B. System Performance Evaluation.

Table 10. System Performance Evaluation

P	Mean Score	Precentage Score	Average
B1	42/10 = 4.2	4.2/5 x 100% = 84%	83%
B2	40/10 = 4.0	4.0/5 x 100% = 80%	
B3	45/10 = 4.5	4.5/5 x 100% = 90%	
B4	38/10 = 3.8	3.8/5 x 100% = 76%	

Based on the evaluation results, the average score for the system performance aspect reached 83%, indicating that the system operates in a stable and responsive manner. However, indicator B4 received the lowest score at 76%, which may be attributed to internet connectivity issues. Since the system is web-based, an unstable connection could hinder data from loading properly, creating the impression of a bug even though it is not caused by a system malfunction.

C. Evaluation of System Experience and Interface Display

Table 11. Evaluation of System Experience and Interface Display

P	Mean Score	Precentage Score	Average
C1	42/10 = 4.2	4.2/5 x 100% = 84%	84%
C2	43/10 = 4.3	4.3/5 x 100% = 86%	
C3	41/10 = 4.1	4.1/5 x 100% = 82%	
C4	41/10 = 4.1	4.1/5 x 100% = 82%	
C5	42/10 = 4.2	4.2/5 x 100% = 84%	

Based on the evaluation results, the average percentage score for the system experience and interface variable reached 85%. These outcomes confirm that the interface and design elements are consistent with user expectations and enhance overall usability.

D. Efficiency and Productivity Evaluation

Table 12. Efficiency and Productivity Evaluation

P	Mean Score	Precentage Score	Average
D1	42/10 = 4.2	4.2/5 x 100% = 84%	85%
D2	41/10 = 4.1	4.1/5 x 100% = 82%	
D3	43/10 = 4.3	4.3/5 x 100% = 86%	
D4	44/10 = 4.4	4.4/5 x 100% = 88%	
D5	43/10 = 4.3	4.3/5 x 100% = 86%	

Based on the evaluation results, the average percentage for the system efficiency and productivity variables is 85%. This indicates that the system contributes to improving work effectiveness and supports the achievement of optimal outcomes in accordance with user requirements.

Based on the results of the User Acceptance Testing (UAT) questionnaire evaluation, the summarized findings are presented in the table below:

Table 13. Final Result of the User Acceptance Testing (UAT)

No	Variable	Percentage Score %	Description
1	System Functionality	83%	Very Good
2	System Performance	83%	Very Good
3	System Experience and Interface Display	84%	Very Good
4	Efficiency and Productivity	85%	Very Good

Based on the average results summarized in Table 13, the overall average score of all evaluation variables is 84%. This shows that the website-based stock opname system implemented at PLTGU Tanjung Uncang is in the “Very Good” category according to established score interpretation criteria. Therefore, the system is considered to meet the standards of functional feasibility, system performance, interface experience and appearance, and operational efficiency in accordance with user needs within the warehouse operational environment.

5 Conclusion

The results of this study demonstrate that the design and implementation of a website-based stock opname system at PLTGU Tanjung Uncang significantly enhance the effectiveness and efficiency of warehouse inventory management. The system was developed systematically using the Waterfall method, which includes the stages of requirement analysis, system design, implementation, integration and testing, and maintenance. This digital solution successfully addresses the limitations of the previous manual process, such as susceptibility to human error and the system lacks visibility of real-time inventory data.

The implemented system has improved overall efficiency of warehouse operations by enabling real-time stock updates, simplifying inventory control, and supporting accurate and timely decision-making. The system evaluation was conducted using a descriptive quantitative approach through the User Acceptance Testing (UAT) method, which involved ten warehouse users. The assessment focused on four key aspects: system function, performance, interface display, and operational efficiency, which produced an average score of 84%, which is included in the "very good" category. This finding suggest that the system is well accepted and considered effective by users in supporting warehouse operation.

The implementation of this system represents a strategic step towards digitalization of logistics processes within the energy sector. Therefore, this system is recommended to be continuously developed, for example by adding a minimum stock notification fea-

ture. Additionally, periodic training using digital modules needs to be provided to warehouse staff so that the use of the system is more evenly distributed and consistent. Continuous evaluation is also important to adjust the system to dynamic operational needs.

For future research, it is advisable to assess the system's impact on logistics cycle time, as well as cost efficiency and long-term performance outcomes. With its demonstrated effectiveness, this system holds the potential to serve as a reference model for warehouse management technologies not only at PLTGU Tanjung Uncang but also across other power generation units in Indonesia. Its scalability and adaptability position them as a strategic asset in accelerating digital transformation in the energy logistics sector.

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