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Development of a Web-Based Spare Parts Inventory System Using the First-In, First-Out Method and Acceptance Analysis Based on the Unified Theory of Acceptance and Use of Technology

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Abstract

As a service-oriented company, Jaya Sentosa faces significant challenges in managing its spare parts inventory, leading to resource inefficiencies. Key issues include documentation discrepancies, inventory inconsistencies, and inadequate monitoring mechanisms. To address these problems, this study designs and implements a web-based information system, referred to as SIWEB-JS, aimed at enhancing inventory accuracy and operational efficiency. The system was developed using the Rapid Application Development (RAD) approach, adopting the First-In, First-Out (FIFO) principle, and built with PHP using the CodeIgniter v4.4.4 framework, supported by a MySQL database. System functionality was evaluated through Black-Box Testing, while user acceptance was assessed using the Unified Theory of Acceptance and Use of Technology (UTAUT). The results indicate that SIWEB-JS effectively records real-time transactions, maintains accurate inventory levels, and improves data accessibility. The implementation of FIFO contributed to better inventory governance. Furthermore, the UTAUT-based evaluation revealed that Performance Expectancy (PE), Effort Expectancy (EE), and Social Influence (SI) significantly influenced Behavioral Intention (BI), suggesting that the system is perceived as useful, user-friendly, and well-supported by users.

Keywords: First-In, First-Out (FIFO), Inventory System, Pearson Correlation Coefficient, Rapid Application Development (RAD), Unified Theory of Acceptance and Use of Technology (UTAUT).

1. Introduction

Jaya Sentosa is a service company located in Sidoarjo, Indonesia. The company provides air-compressor maintenance and repair. One of its main challenges is managing the spare parts inventory, consisting of manual inventory processing which often leads to documentation mismatch (Ikhwan, Amri, & Harahap, 2025), inaccurate stock, and difficulties in monitoring the movement of spare parts in the warehouse.

Inventory management is a critical process that involves the administration and documentation of assets with economic value, such as equipment, machinery, buildings, and infrastructure. According to Novendri, Saputra, & Firman (2019), as well as Usnaini, Yasin, & Sianipar (2021), inventory management includes recording the availability of items obtained through purchases, donations, or grants, in compliance with institutional regulations. Similar challenges are encountered by chemical raw material distributors, where inventory systems are designed to enable systematic, accurate, and efficient stock monitoring and record-keeping to minimize the risk of product expiration (Sembiring, Tampubolon, Sitanggang, Turnip, & Subash, 2019). The First-In, First-Out (FIFO) method plays a vital role in distinguishing between older and newer stock, thereby improving inspection and retrieval efficiency. The computerization of inventory systems, using tools such as Visual Studio and SQL Server, has been shown to effectively support FIFO implementation and prevent overstocking that may result in product expiration.

Inventory information systems offer various advantages, including improved operational efficiency, simplified documentation, and cost reduction (Mathaba, Dlodlo, Williams, & Adigun, as cited in Bose, Mondal, Sarkar, & Roy, 2022). These systems also enable real-time access to inventory information (Roosevelt, Veemaraj, & Kirubakaran, 2024), and facilitate greater flexibility (Mbugi & Lutego, 2022) and efficiency (Huda & Amalia, 2020; Erlangga, Yunita, & Satriana, 2022). Additional features, such as automatic monitoring and critical stock notifications (Mathaba, Adigun, Oladosu, & Oki, 2017), as well as integrated search functionalities (Huda & Amalia, 2020), further enhance system effectiveness.

This study aims to design and implement a web-based inventory management system for a service-oriented company using the Rapid Application Development (RAD) methodology, which supports accelerated project completion and active stakeholder collaboration during software development (Saputera, Sunardi, & Zulkarnain, 2022). The FIFO method is adopted to support the monitoring process, ensuring that the first-in spare parts are the first to be dispatched from the warehouse when an order is received (Fazli & Jurmaryadi, 2019). The system includes features such as stock monitoring and critical stock level notifications. A case study was conducted at Jaya Sentosa. The system defines three user roles: inventory manager, inventory staff, and technician. The inventory staff is responsible for documenting incoming and outgoing stock items and for ensuring that all transactions are accurately recorded.

The system was evaluated using Black Box testing to ensure system functionality without looking at the code of the program (Hendri, Manurung, Ferian, Hanaatmoko, & Yulianti, 2020). UTAUT has been used to analyze user acceptance from four core construct: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC), which collectively impact to Behavioral Intention (BI) (Mengying, et al., 2024). The implementation of UTAUT is expected to provide practical contributions in reducing human errors and improving the effectiveness of of inventory management processes. This study also offers theoretical contributions in understanding technological acceptance in the context of inventory management, with the potential adoption of the method to various sectors, such as manufacturing companies, otomotive, and logistic, which face similar challenges on otomation, FIFO, and system acceptance using UTAUT.

2. Methods

This study develops a web-based system using the Rapid Application Development (RAD) methodology. RAD accelerates system delivery—often within 30 to 90 days (Saputera, Sunardi, & Zulkarnain, 2022)—through short, iterative cycles that incorporate active user feedback and prototyping, thereby improving system fit and user satisfaction (Tan, et al., 2023). Compared to the linear and requirements-fixed Waterfall model, RAD offers greater flexibility and adaptability to changing needs, although it requires strong and sustained commitment from both the development team and end users (Murdiani & Sobirin, 2022). Based on these considerations, this study applies RAD in three phases:

2.1. Requirements Planning

In In this phase, a requirement analysis is conducted to extract the requirements of the Jaya Sentosa. A series of interview was conducted involving the inventory manager, inventory staff, and technicians to analyze the problems. A direct observation is also conducted to obtain the business process of documentation, monitoring, and stock management. Further, a literature review was conducted to identify best practices for a web-based inventory system.

The findings highlighted several problems, which are: delayed stock entries, errors in recording incoming and outgoing items, and limited transparency in tracking spare parts. To resolve these issues, the system was designed with core features: inbound/outbound transaction logging, FIFO-based stock monitoring, and automatic low-stock notifications.

2.2. System Design

After analyzing the system requirements, the system was designed using a structured approach to ensure user needs were met. The application was built with the CodeIgniter framework version 4.4.4 using the Model–View–Controller (MVC) pattern, enabling a dynamic PHP-based website (Gunawan & Sutarman, 2020). MySQL serves as the Database Management System (DBMS), leveraging Structured Query Language (SQL) and supporting multithreaded, multiuser execution (Dhika, Isnain, & Tofan, 2019).

Business Process Model and Notation (BPMN) was used as the graphical standard to model the business processes systematically. BPMN was used as a graphical standard to visualizes activities, control flow, and process sequences, helping stakeholders understand and improve process efficiency (Aprillianie & Muarie, 2023; Firdaus, 2022; Sholiq & Yaqin, 2024). Use Case Diagrams, Flowcharts, Activity Diagrams, and Sequence Diagrams are also depicted to provide a comprehensive view of user–system interactions

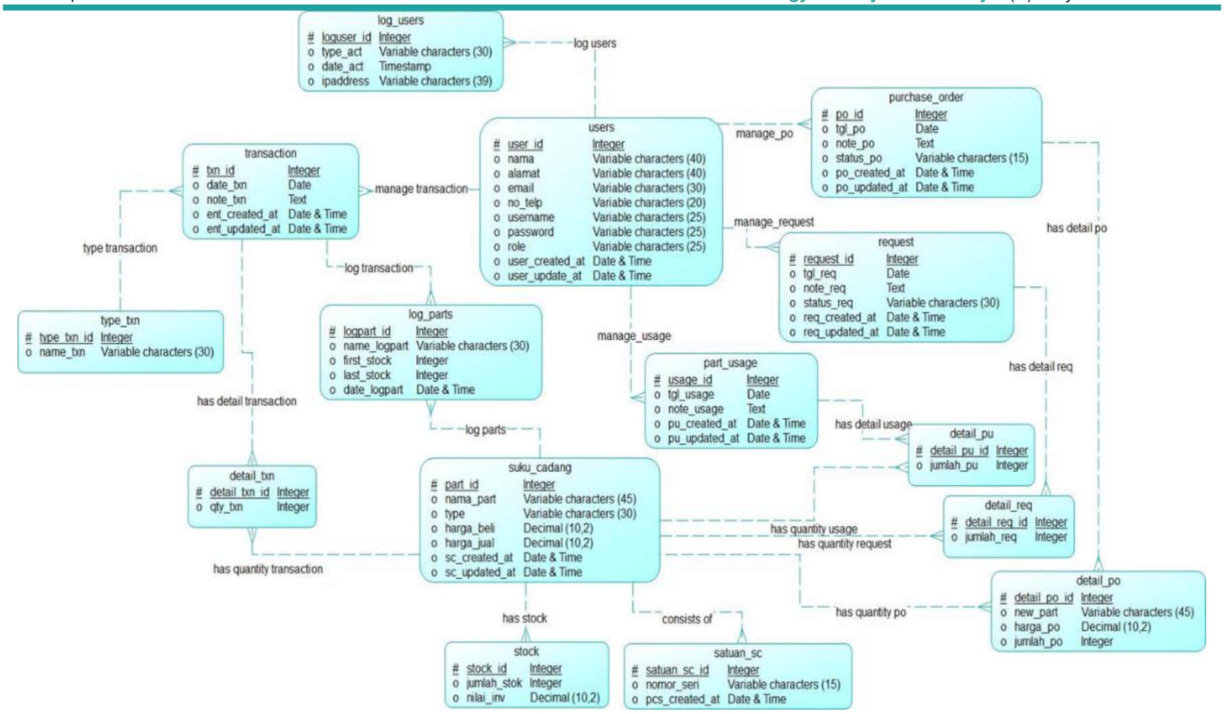

Fig. 1. Conceptual Data Model of the web-based spare parts inventory system at Jaya Sentosa.

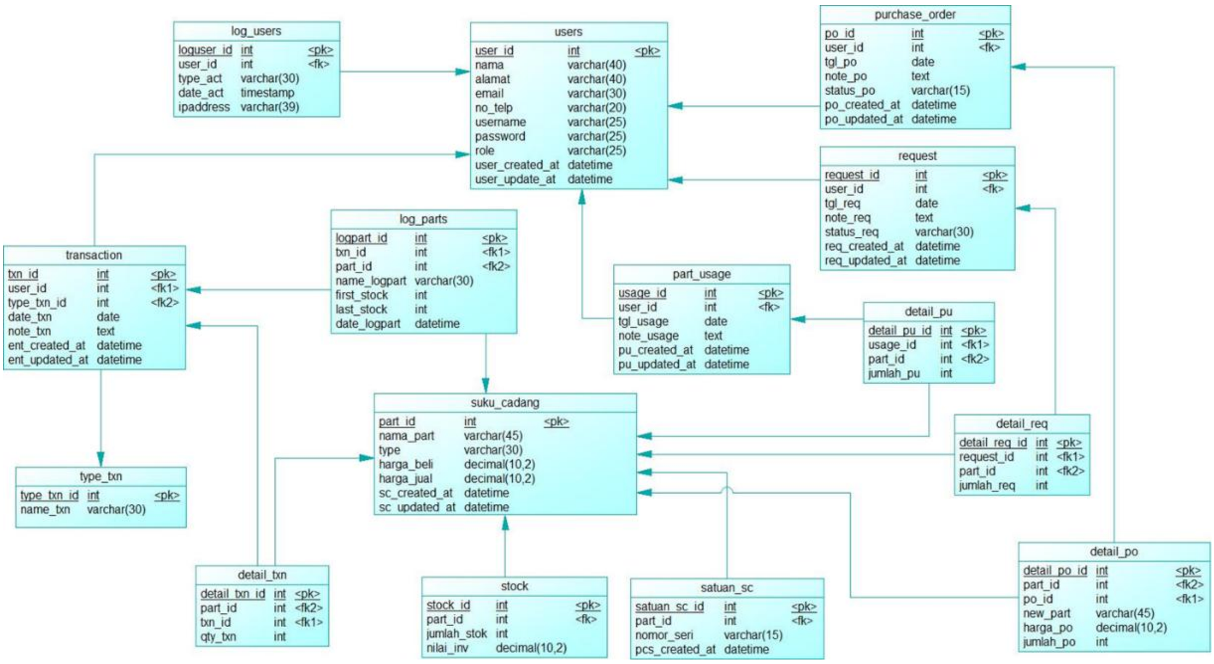

Fig. 2. Physical Data Model of the web-based spare parts inventory system at Jaya Sentosa.

and the user-interface design.

2.2.1. Database

The database design consists of two components: the Conceptual Data Model (CDM) and the Physical Data Model (PDM). The CDM defines the overall data structure and relationships by visualizing table interconnections at a conceptual level using standardized notations (Syahroni, Heryadi, Multazami, & Ramadhani, 2021). In contrast, the PDM describes how these tables are physically stored, managed, and accessed within the database environment (Syahroni, Heryadi, Multazami, & Ramadhani, 2021).

Fig. 1 illustrates the CDM of the web-based inventory system, highlighting key entities, including:

- users (user information),
- purchase_order and detail_po (procurement),

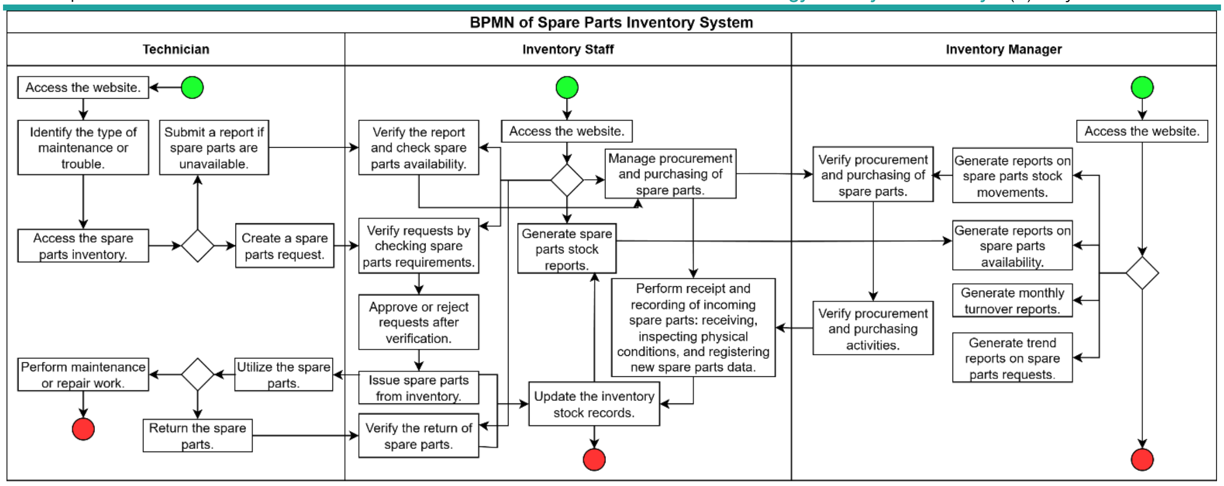

Fig. 3. Business Process Model and Notation diagram of the web-based spare parts inventory system.

- request and detail_req (technician request),
- part_usage and detail_pu (spare part usage),
- suku_cadang, satuan_sc, and stock (inventory information), and
- log_users, log_parts, transaction, detail_txn, and type_txn (activity logging and transaction types).

The conceptual model provides a comprehensive overview of how data entities interrelate to support inventory operations at Jaya Sentosa.

Fig. 2 presents the PDM, detailing the principal database tables—users, purchase_order, detail_po, request, detail_req, part_usage, detail_pu, suku_cadang, stock, satuan_sc, log_users, log_parts, transaction, detail_txn, and type_txn—along with the implementation of primary and foreign keys used to establish relational links. This model represents the physical database schema implemented in MySQL to manage inventory operations effectively.

2.2.2. Business Process Model and Notation (BPMN)

Fig. 3 presents the Business Process Model and Notation (BPMN) diagram for the inventory system, involving three primary roles: technician, inventory staff, and inventory manager. The BPMN illustrates the end-to-end workflow—from request submission to reporting—and highlights the interactions among these roles in managing spare parts inventory.

Inventory staff are responsible for receiving and recording goods from suppliers, verifying technicians' requests, issuing spare parts, and monitoring as well as reporting low stock levels. Technicians identify maintenance or repair needs, submit spare parts requests, and notify relevant personnel when requested items are unavailable. Inventory managers receive system-generated reports on stock availability, inventory movements, and monthly turnover, and they verify procurement documentation to ensure alignment with operational requirements.

2.2.3. Use case diagram

A Use Case Diagram describes the interactions between one or more actors and the system under development. Generally, it is used to identify the system's functions and to determine which actors are authorized to access those functions (Wijaya & Christian, 2019). Fig. 4 presents the Use Case Diagram illustrating the available functions of the spare parts inventory system and the interaction relationships between the system and its actors.

The diagram includes four primary actors:

- Super Admin, responsible for user management and access rights configuration;
- Inventory Staff, managing procurement, issuance, receipt of spare parts, and generating inventory reports;
- Inventory Manager, authorized to view information and various inventory reports; and
- Technician, responsible for submitting spare parts requests and reporting usage and returns.

All actors are required to log in to perform activities according to their respective roles.

2.2.4. User Interface

The user interface of the system is designed to facilitate inventory management. Each interface is organized according to the user's role, which consists of Inventory Manager, Inventory Staff, and Technician. Figs. 5 to 8 present the page designs corresponding to each respective role.

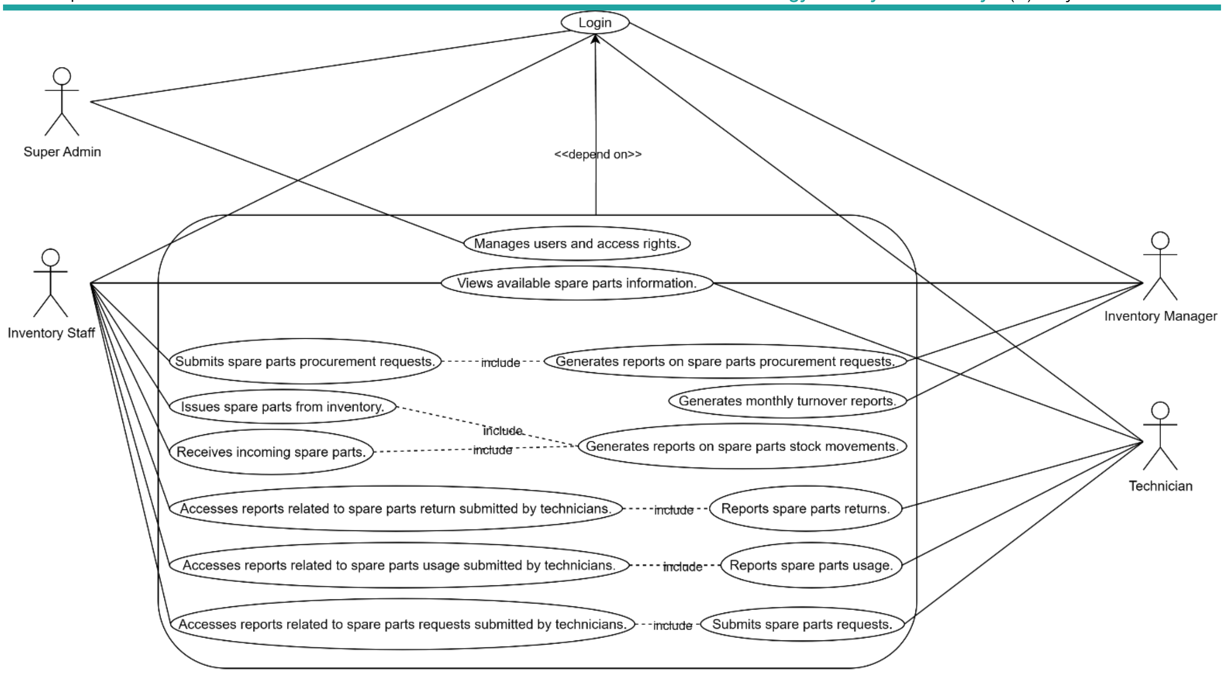

Fig. 4. Use Case Diagram of the web-based spare parts inventory system.

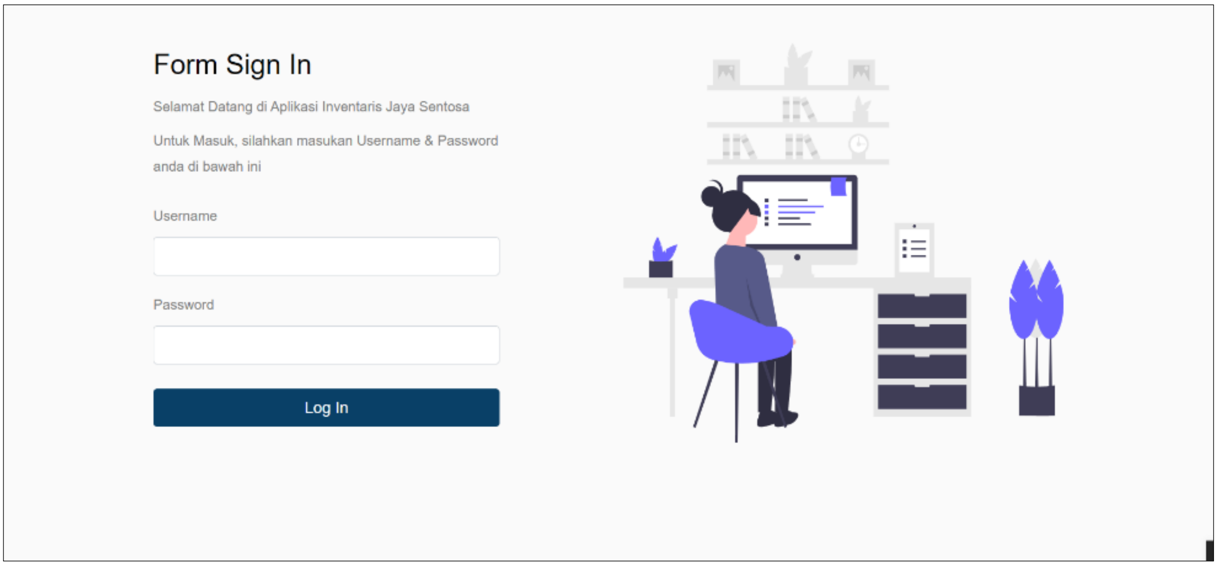

Fig. 5. Login interface of the web-based spare parts inventory management system.

2.3. Implementation

In the implementation phase, the system was built according to the approved design, ensuring each feature met user needs. Testing involved 23 employees directly engaged in spare-parts inventory management and 7 additional individuals with information-systems knowledge. This mix ensured the system supported daily operations while meeting technical quality expectations: employees contributed first-hand, task-focused feedback, and the second group offered an objective view of functionality.

A key feature is FIFO-based stock management, ensuring the first items received are the first recorded as issued. FIFO manages inventory so earlier arrivals are used or sold first (Fazli & Jurmaryadi, 2019), helping prevent old-stock accumulation and reducing risks of damage, spoilage, and waste, especially for limited-shelf-life items (Barto, Eruguz, Spliet, & Wøhlk, 2024). stock data are ordered by arrival timestamps, and the system automatically selects the earliest timestamp during issue transactions. The source code for the SIWEB-JS is publicly available on GitHub: https://github.com/adamfiirds/system-inventory-siweb-js.

To validate the system, functionality was assessed using Black Box Testing, while user acceptance

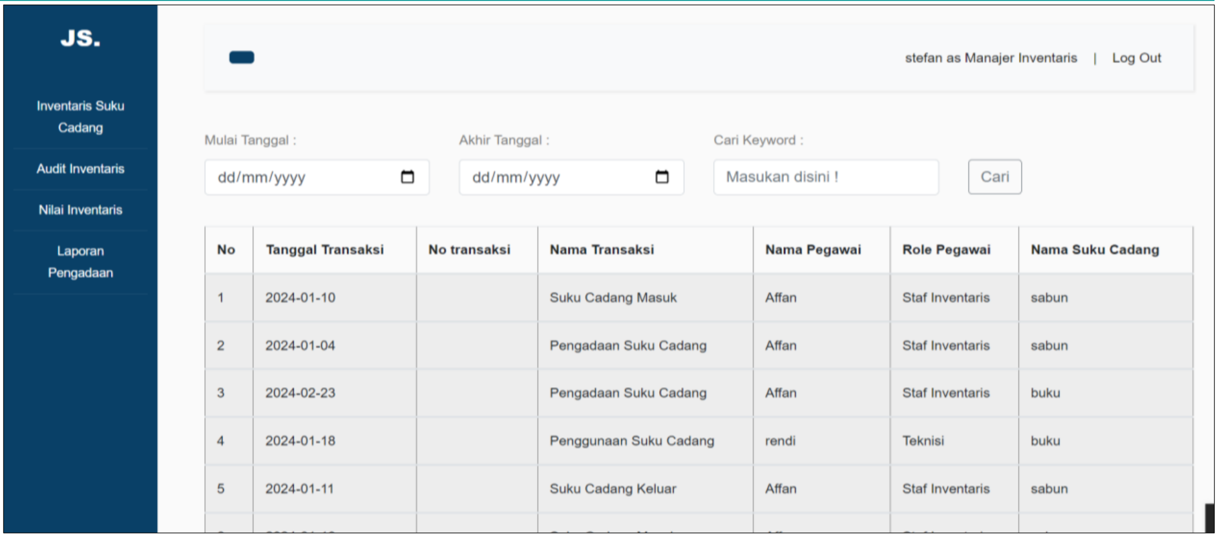

Fig. 6. Inventory management page interface for the Inventory Manager role.

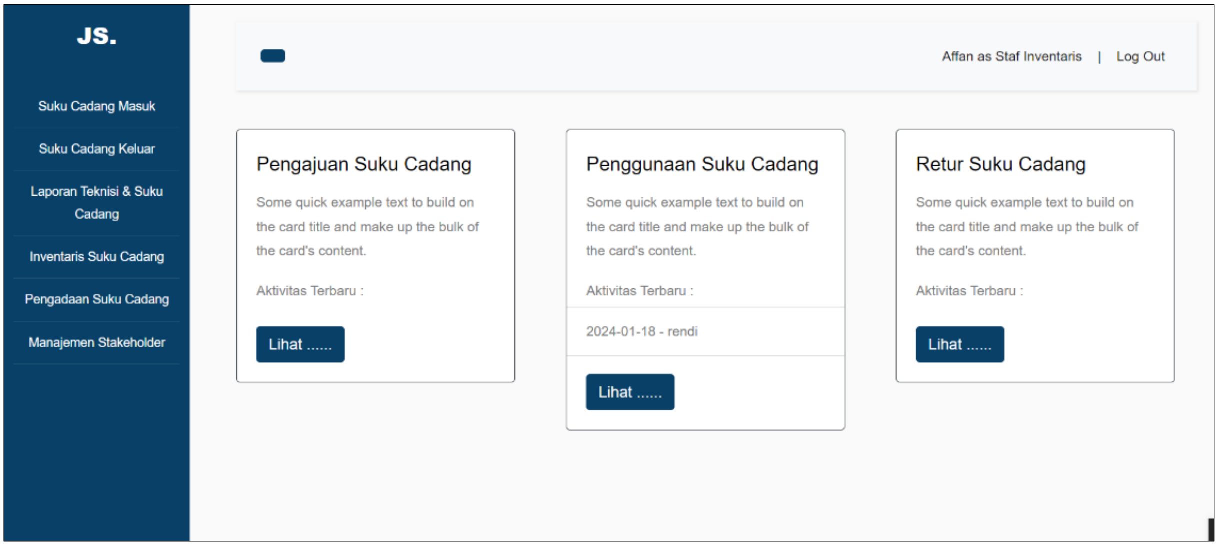

Fig. 7. Inventory management page interface for the Inventory Staff role.

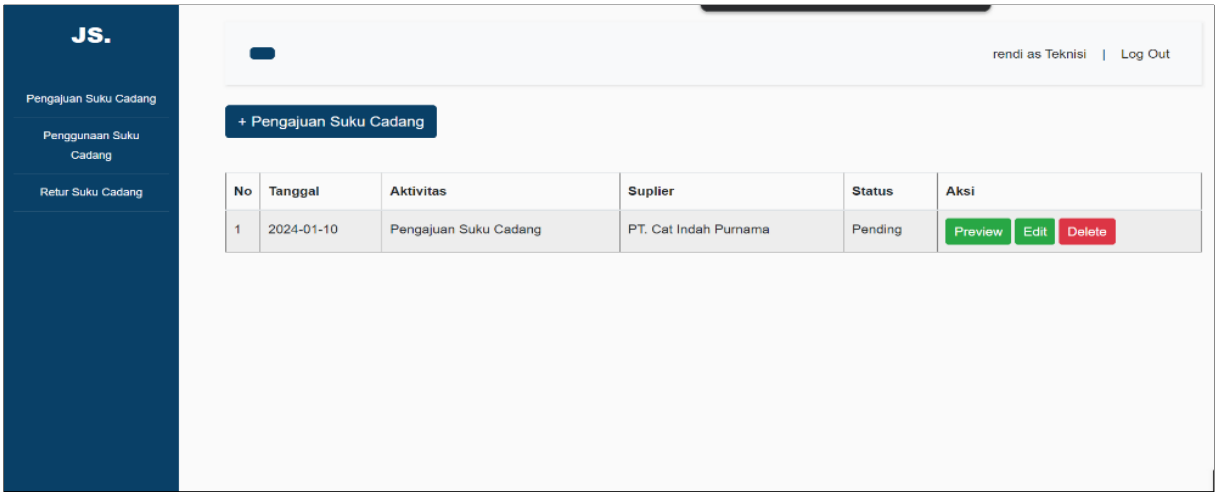

Fig. 8. Inventory page interface for the Technician role.

was evaluated based on the Unified Theory of Acceptance and Use of Technology (UTAUT). The Pearson

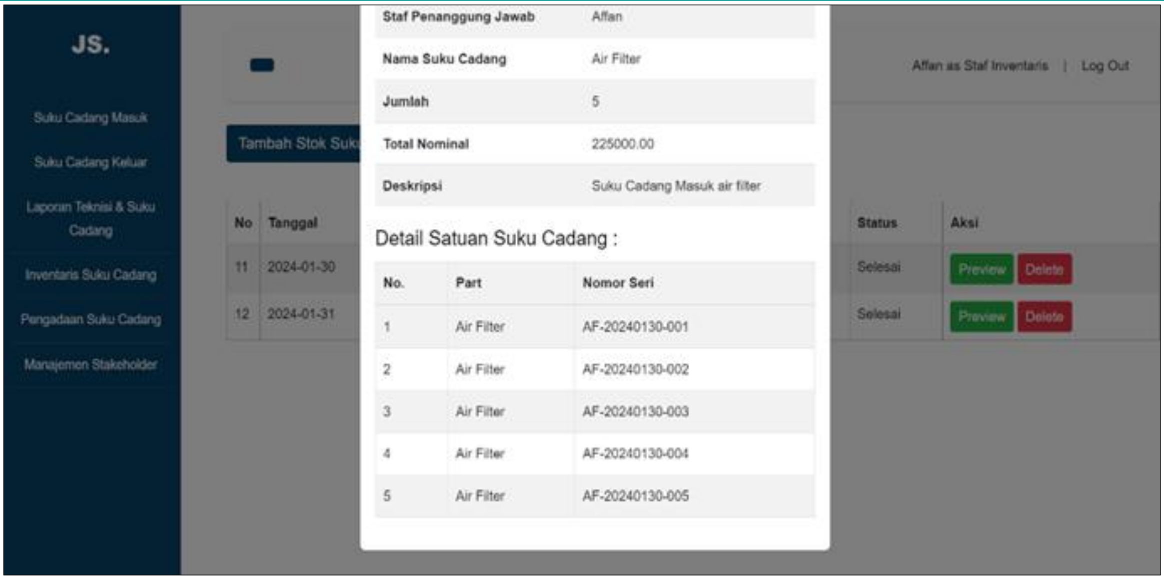

Fig. 9. Interface view showing detailed data of incoming spare parts.

Table 1
Data of incoming spare parts transactions.

ID	Test Case	Test Description	Expected Results	Actual Results	Conclusion
F.01	Stock addition	Enter spare parts data	• System correctly adds stock. • Data is accurately recorded. • Stock information is updated correctly.	• System successfully adds stock correctly. • Data is accurately recorded. • Stock information is accurate.	Succeed

correlation coefficient was used to examine the relationships between Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) with Behavioral Intention (BI). The analysis reported correlation coefficients ranging from −1 to 1, with statistical significance determined at $\alpha = 0.05$.

3. Results and Discussion

3.1. System Inventory Implementation

Fig. 9 shows the details of spare parts added to stock in the SIWEB-JS. Table 1 presents the black-box test results for the stock-addition feature. In this test, five Air Filters were added to the system. Each item was assigned a serial number in order of arrival: AF-20240130-001 through AF-20240130-005, with the correct entry date recorded as January 30, 2024. The system accurately captured all information and updated stock data accordingly. The updated stock details are shown in Fig. 10, listing the five Air Filters with their serial numbers and entry dates.

Fig. 11 displays detail item of spare parts issued from stocks. According to the FIFO, the first items received are the first to be issued. Table 2 shows the black-box testing for the stock reduction feature. The system successfully issued three Air Filters as expected, beginning with the earliest serial numbers: AF-20240130-001, AF-20240130-002, and AF-20240130-003. After the reduction, the system updated the inventory to show two remaining Air Filters. These outcomes indicate the stock-reduction process functioned as intended, as depicted in Fig. 12.

3.2. Acceptance Testing using UTAUT

This subsection analyzes user acceptance of SIWEB-JS using the UTAUT model. The approach assesses the extent to which the model's factors influence users' intentions and actual system use.

3.2.1. Experimental design

The research instrument in this study was a questionnaire based on the UTAUT model, comprising five main constructs: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), and Behavioral Intention (BI). Each construct was measured using 13 items, developed on a five-point Likert scale, as shown in Table 3. Respondents rated their level of agreement with

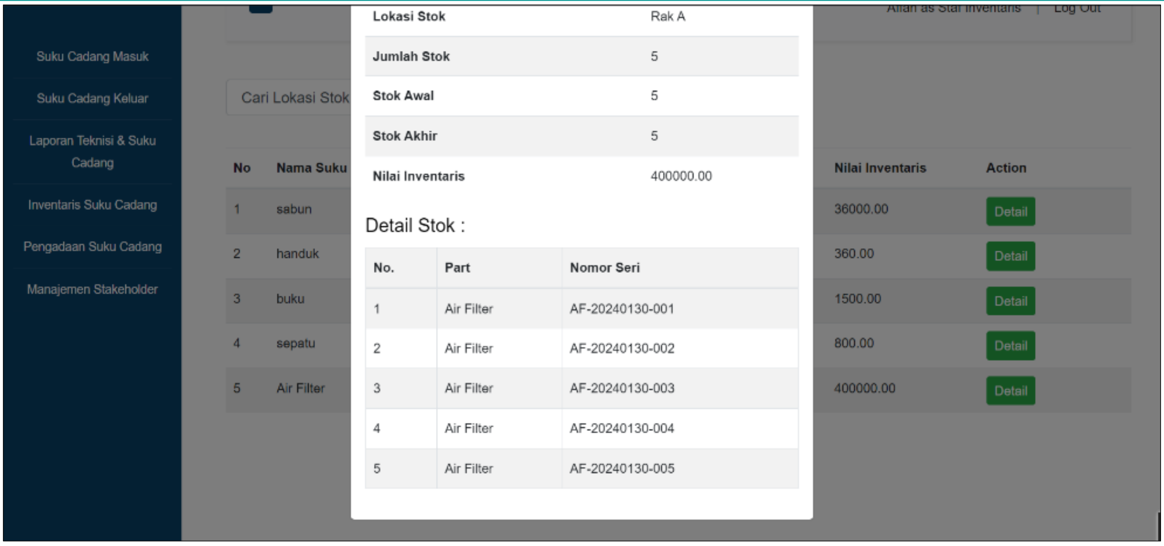

Fig. 10. Interface view showing detailed spare parts stock information.

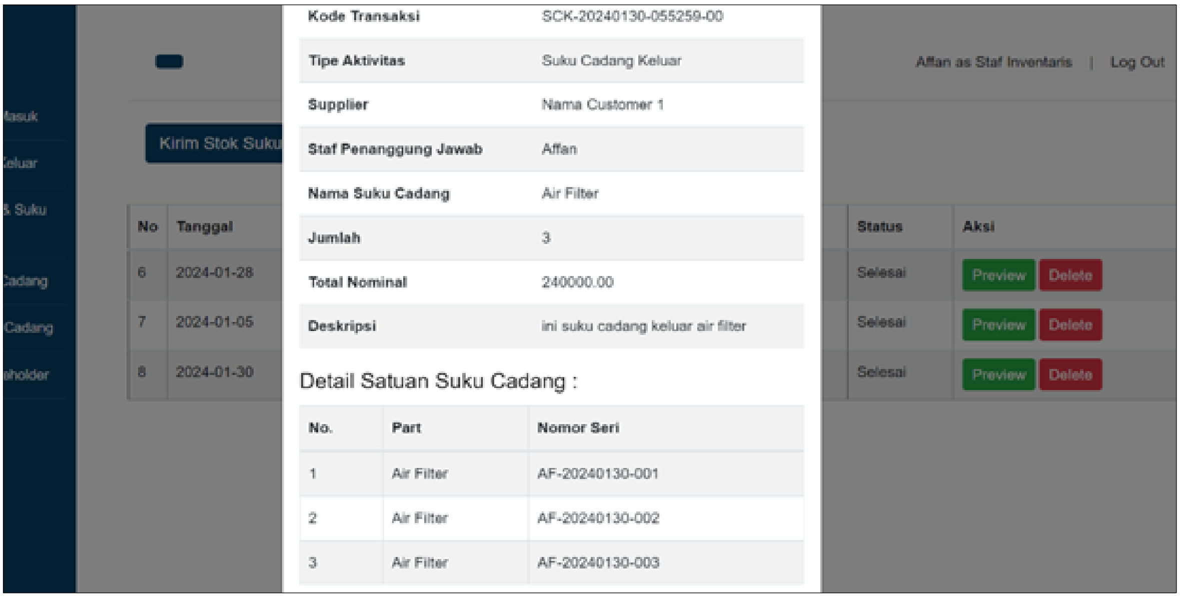

Fig. 11. Interface view showing detailed data of outgoing spare parts.

Table 2
Outgoing spare parts data.

ID	Test Case	Test Description	Expected Results	Actual Results	Conclusion
F.02	Stock Reduction	• Input data for spare parts removal. • Verify the FIFO order of stock removal. • Verify the accuracy of stock information.	• The system reduces stock according to the FIFO principle. • Stock information is accurately updated.	• The system successfully reduces stock according to the FIFO principle. • Stock information is accurate.	Succeed

each statement based on their experience using the SIWEB-JS system.

The items were contextualized to fit the workplace environment of SIWEB-JS. Of the 30 respondents, 23 were employees of Jaya Sentosa directly involved in spare parts management, while the remaining 7 had expertise in information systems and offered a technical and objective perspective. The breakdown of items by construct and code is presented in Table 4.

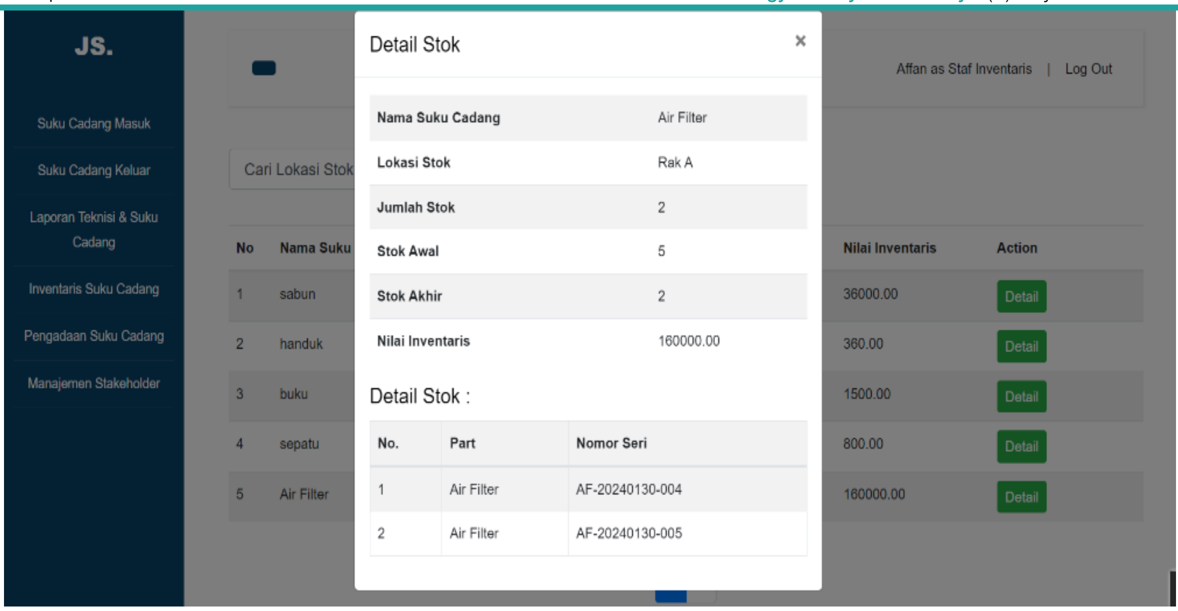

Fig. 12. Spare parts stock data overview.

Table 3
Response evaluation weights.

No	Category	Score Weight
1.	Strongly Agree (SA)	5
2.	Agree (A)	4
3.	Moderately Agree (MA)	3
4.	Disagree (D)	2
5.	Strongly Disagree (SD)	1

Table 4
Questionnaire codes and statements.

Factor	Code	Statement
PE	PE1	SIWEB-JS has helped reduce errors in spare parts management compared to the previous method.
	PE2	SIWEB-JS makes it easier for me to efficiently monitor spare parts availability.
	PE3	The accuracy of my stock recording has improved since using SIWEB-JS compared to the previous method.
	PE4	With SIWEB-JS, I can complete tasks faster than with the manual method.
EE	EE1	The time required to learn and use SIWEB-JS is reasonable.
	EE2	The information I need in SIWEB-JS is easy to find without much effort.
SI	SI1	SIWEB-JS has become an integral part of the workflow at Jaya Sentosa.
	SI2	The company actively encourages the use of SIWEB-JS to support work activities.
FC	FC1	I have access to the necessary devices to use SIWEB-JS.
	FC2	I receive the support and training required to use SIWEB-JS.
BI	BI1	I will continue to use SIWEB-JS in my daily work.
	BI2	I find SIWEB-JS useful and will continue using it in the future.
	BI3	I feel more comfortable using SIWEB-JS compared to the previous method.

3.2.2. Likert scale and scoring criteria

This study used a five-point Likert scale to measure responses to 13 statements derived from UTAUT factors. Each category was assigned a weight as shown in Table 3, following common practice that a 5-point (odd) scale balances reliability, validity, and ease of interpretation (Kusmaryono, Wijayanti, & Maharani, 2022).

Responses from 30 participants were scored by multiplying the count in each category by its weight to obtain a total per statement; results are shown in Table 5. We then computed the mean and percentage for each item—treating Likert data as interval to allow descriptive statistics (Kusmaryono, Wijayanti, & Maharani, 2022) and interpreted percentages using the ranges in Table 6. The final outcomes (Table 7) indicate that SIWEB-JS received very positive feedback overall, with an average score of 4.20 and 84%,

Table 5
Respondents' scores multiplied by weight values.

Question		Response					Weighted Score
		SS×5	S×4	CS×3	TS×2	STS×1	
PE	PE1	12	15	3	0	0	129
	PE2	11	14	5	0	0	126
	PE3	12	15	3	0	0	129
	PE4	16	10	4	0	0	132
EE	EE1	10	13	7	0	0	127
	EE2	14	12	4	0	0	130
SI	SI1	7	14	8	1	0	117
	SI2	8	15	7	0	0	121
FC	FC1	14	10	6	0	0	128
	FC2	11	13	6	0	0	125
BI	BI1	16	10	4	0	0	132
	BI2	11	15	4	0	0	127
	BI3	15	12	3	0	0	132
						Total	1651

Table 6
Score categorization criteria.

No	Category	Weighted Score (%)
1.	Excellent	81-100
2.	Good	61-80
3.	Fair	41-60
4.	Poor	21-40
5.	Very Poor	0-20

Table 7
Mean scores, percentages, and score categories of UTAUT questionnaire items.

Question		Mean Score	Percentage (%)	Score Category
PE	PE1	4.30	86	Excellent
	PE2	4.20	84	Excellent
	PE3	4.30	86	Excellent
	PE4	4.40	88	Excellent
EE	EE1	4.10	82	Excellent
	EE2	4.33	87	Excellent
SI	SI1	3.90	78	Good
	SI2	4.03	81	Excellent
FC	FC1	4.27	85	Excellent
	FC2	4.17	83	Excellent
BI	BI1	4.40	88	Excellent
	BI2	4.23	85	Excellent
	BI3	4.40	88	Excellent
Average		4.20	84	

categorized as "Very Good."

3.2.3. Validity and reliability testing

Before analyzing system acceptance with the UTAUT model, validity and reliability tests were conducted on the questionnaire to ensure each item accurately and consistently measured its intended factor. Validity was assessed using Pearson correlation between each item and its factor's total score (Nursichati, Susongko, & Mulyono, 2025), with 30 respondents and $\alpha = 0.05$. All 13 items showed r calculated > r table (0.361) with p-value < 0.05, indicating significant correlations; thus, the instrument is valid (see Table 8).

Reliability was evaluated with Cronbach's Alpha, commonly used for non-dichotomous (Likert-scale) instruments (Setyaedhi, 2024). Values ≥ 0.70 are generally considered good, while ≥ 0.60 may be acceptable for exploratory studies. In this study, all UTAUT factors achieved alphas between 0.617 and 0.676, classifying the instrument as reliable (see Table 9).

3.2.4. Hypotesis testing using Pearson Correlation

To examine how UTAUT factors relate to users' Behavioral Intention (BI) to use SIWEB-JS, hypothesis

Table 8
Validity test results.

Factor	Variable	r-calculated	r-tabel	p-value (Sig.)	Remark
Performance Expectancy	PE1	0.709	0.361	<0.001	Valid
	PE2	0.713	0.361	<0.001	Valid
	PE3	0.624	0.361	<0.001	Valid
	PE4	0.698	0.361	<0.001	Valid
Effort Expectancy	EE1	0.878	0.361	<0.001	Valid
	EE2	0.860	0.361	<0.001	Valid
Social Influence	SI1	0.878	0.361	<0.001	Valid
	SI2	0.844	0.361	<0.001	Valid
Facilitating Conditions	FC1	0.860	0.361	<0.001	Valid
	FC2	0.844	0.361	<0.001	Valid
Behavioral intention	BI1	0.749	0.361	<0.001	Valid
	BI2	0.804	0.361	<0.001	Valid
	BI3	0.706	0.361	<0.001	Valid

Table 9
Reliability test results.

Factor	Cronbach's Alpha	Threshold	Remark
Performance Expectancy	0.625	0.60	Reliabel
Effort Expectancy	0.676	0.60	Reliabel
Social Influence	0.650	0.60	Reliabel
Facilitating Conditions	0.621	0.60	Reliabel
Behavioral intention	0.617	0.60	Reliabel

Table 10
Pearson Correlation test results.

Variable Relationship	Pearson Correlation (r)	Significance (2-tailed)	Hypothesis Decision
PE – BI	0.606	<0.001	H_1 accepted
EE – BI	0.441	0.015	H_2 accepted
SI – BI	0.421	0.020	H_3 accepted
FC – BI	0.229	0.223	H_4 accepted

testing was performed using Pearson correlation. The analysis assessed links between Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) and BI, following prior studies (Mengying, et al., 2024). Pearson was chosen because the data were approximately normally distributed which became a key assumption for this test (Mengying, et al., 2024). Analyses were conducted in SPSS with (α) 0.05.

Hypotheses:

- H_0: No significant relationship exists between UTAUT factors (PE, EE, SI, FC) and BI.
- H_1: There is a significant relationship between UTAUT factors (PE, EE, SI, FC) and BI.

Factor-specific hypotheses:

- H_1: PE is significantly related to BI.
- H_2: EE is significantly related to BI.
- H_3: SI is significantly related to BI.
- 3: FC is significantly related to BI.

Decision rule (Sig. 2-tailed):

- If Sig. < 0.05 → reject H_0 (significant relationship).
- If Sig. ≥ 0.05 → fail to reject H_0 (no significant relationship).

Pearson correlation results for each factor vs. BI are reported in Table 10.

Based on the tests, PE, EE, and SI show positive, significant correlations with BI, indicating that improvements in these factors increase users' intention to use SIWEB-JS. Among them, PE has the strongest association ($r = 0.606$), suggesting perceived benefits play a major role in shaping intention.

Conversely, FC is not significantly related to BI ($p = 0.223 > 0.05$), implying that supporting facilities are not a primary driver of intention in this context. Overall, PE, EE, and SI are key to promoting user acceptance and use of SIWEB-JS. Future development should therefore emphasize ease of use, perceived benefits, and social support.

3.2.5. Acceptance testing

According to the Pearson correlation, a relationship between factors in UTAUT are analyzed. The results indicated that:

- PE $(r = 0.606, p < 0.001)$ indicated that user epectation on the system regarding the system capability to enhance user performance strongly increases their intention to use it.
- EE $(r = 0.441, p = 0.015)$ indicated that user perception on the ease of the systems positively affects intention, though less strongly than PE.
- SI $(r = 0.421, p = 0.020)$ indicated that support or pressure from coworkers, supervisors, and the work environment moderately encourages intention to use.
- FC $(r = 0.229, p = 0{,}223)$ indicated that available facilities or technical support do not significantly affect intention in this context.

As a conclusion, three UTAUT factors significantly shape users' intention to adopt and use SIWEB-JS, whereas FC does not. Thus, perceived benefits, ease of use, and social support are more decisive than supporting infrastructure. Consequently, SIWEB-JS is viewed as improving operational efficiency because users experience clear ease and tangible benefits in practice.

4. Conclusions

This study is motivated by industrial problem faced by Jaya Sentosa in managing their inventory system which leads to documentation mismatch, inaccuracy of inventory, and difficulty tracking item movement. In response, we developed SIWEB-JS, a web-based inventory system designed to improve efficiency and accuracy.

The primary objective of this study is to design an inventory information system that supports real-time stock recording and reliable, structured decision-making. The system was developed using RAD, implements FIFO for stock control, and employs CodeIgniter 4.4.4 (PHP) with MySQL. Evaluation combined black-box testing and a user-acceptance analysis based on UTAUT.

Results show that SIWEB-JS records inventory transactions accurately and in real time, enables better stock monitoring, and provides interfaces tailored to three user roles: manager, staff, and technician. Black-box tests confirmed that all core features worked as specified, and FIFO effectively governed stock rotation. From a user-acceptance perspective, PE, EE, and SI were significantly related to BI, indicating that the system is perceived as beneficial, easy to use, and socially supported within the organization. However, the study has limitations: (1) the small size of respondents that are used $(n = 30)$ potentially limiting generalizability of the study; (2) functionality assessment without a comprehensive analysis of technical performance, security, or user experience that are used could potentially overlook important factors that are not captured in this study; and (3) UTAUT moderators (e.g., age, experience, usage frequency) were not considered.

Future work should include larger and more diverse samples, expanded evaluation of usability, system performance, and security, and feature enhancements such as automated notifications, interactive report visualizations, and a more responsive, intuitive UI. Acceptance evaluation could be broadened by incorporating TAM or an extended UTAUT with moderating factors to yield deeper, context-specific insights into organizational adoption.

5. Declaration of AI and AI assisted technologies in the writing process

During the preparation of this manuscript, the author(s) made limited use of AI-based tools (such as ChatGPT and Gemini) solely to assist with text translation. All AI-assisted outputs were critically reviewed, verified for accuracy, and thoroughly revised by the author(s) to ensure compliance with academic standards. The author(s) take full responsibility for the originality, accuracy, and integrity of the final content presented in this publication.

6. CRediT Authorship Contribution Statement

Adam Firdaus: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Visualization, and Writing – original draft. Cempaka Ananggadipa Swastyastu: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, and Writing – review & editing. Ratna Nur Tiara Shanty: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, and Writing – review & editing.

7. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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9. Data Availability

The data are private and not available for public sharing.

10. References

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