

Sales And Marketing Management Information System For The Weighbridge At PT Kharisma Putra Mandiri

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ABSTRACT

PT Kharisma Putra Mandiri is a distribution company that still relies on manual data recording to manage sales, purchases, and inventory. This method leads to issues such as delayed reports, data duplication, and limited real-time monitoring. This study aims to design and implement a web-based integrated management information system to support operational efficiency and marketing. The system was developed using the Extreme Programming (XP) methodology, which emphasizes iterative development and active user involvement. UML was used for system modeling, and the system was built with PHP using the CodeIgniter framework and MySQL as the database. Based on User Acceptance Testing (UAT), all features performed well and met functional requirements. Performance testing results showed that most modules responded in under 0.5 seconds, indicating efficient performance. However, the login module showed a slower average response time of 1.71 seconds, which requires optimization. Overall, the system successfully automates key business operations, enhances data accuracy, and improves decision-making capabilities. Further testing involving multiple users is recommended to ensure the system's performance in a more dynamic environment

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INTRODUCTION

The advancement of technology in today's era has been growing significantly, particularly in the business sector including trade and services. One of the most prominent developments is the rapid rise of E-Commerce activities, which drives businesses to utilize information systems to support operational processes. There has been a marked increase in the use of digital platforms by business actors in Indonesia, encompassing sales transactions, marketing strategies, and business data management. This phenomenon highlights that information systems are no longer merely auxiliary tools but have become essential components for companies aiming to improve efficiency, effectiveness, and competitiveness in conducting more modern and integrated business processes (Badan Pusat Statistik, 2025).

Currently, information systems have evolved beyond administrative support tools to become integral in business decision-making processes. An integrated information system enables companies to manage sales, procurement, and inventory data with greater precision and real time accessibility. Modern management



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information systems play a critical role in fostering competitive advantage, enhancing work efficiency, and accelerating data-driven decision making (Laudon & Laudon, 2022).

PT Kharisma Putra Mandiri is a company engaged in general trade and goods distribution. However, many of its operational activities are still recorded manually, using tools such as physical logbooks or unlinked spreadsheet files. This condition has led to multiple challenges, including the risk of data loss, duplication of information, delays in reporting, and difficulties in effectively monitoring inventory and transactions. Additionally, the marketing of its weighbridge services remains suboptimal, relying heavily on word-of-mouth and existing customer networks without the support of digital systems or broader promotional media limiting market reach and diminishing marketing effectiveness in the digital age. Given the current business processes, the company faces several obstacles that impact its operational efficiency and effectiveness. These include frequent data loss and damage due to manual record keeping, difficulty in real-time sales tracking, and limited promotional reach due to outdated marketing methods. The absence of an integrated system further hampers accurate and timely reporting and data analysis, potentially delaying strategic decision-making by management.

Previous studies have identified manual record-keeping as a major bottleneck in sales management, resulting in inefficiency, data entry errors, and sluggish data access. The proposed solution in these studies involves developing a web-based sales information system capable of automating data recording, storage, and reporting in real-time (Sri Rahayu & Pratiwi Olivia Riska Bokings, 2024).

This research adopts the Extreme Programming (XP) methodology as the development approach to build a sales and marketing management information system for PT Kharisma Putra Mandiri. XP is chosen for its strengths in short iterations, close collaboration between developers and users, and continuous testing allowing quick adaptation to changing requirements while ensuring software quality. Prior research has shown that small scale industries using semi-manual systems like Microsoft Excel often encounter issues as transaction volumes increase. As a solution, the XP approach comprising iterative and collaborative stages of planning, designing, coding, and testing was implemented. The results indicate that systems developed with XP significantly improve transaction efficiency, minimize data entry errors, and offer real-time sales reports that support strategic decision-making (Nurandi et al., n.d.).

Based on the problems outlined above and supported by relevant literature, this study aims to develop a web-based sales and marketing management information system for the weighbridge operations at PT Kharisma Putra Mandiri. The implementation of such a system is expected to enhance operational efficiency, improve data recording accuracy, and broaden the marketing reach of the weighbridge services through the use of integrated information technology.

RESEARCH METHOD

1. Data Collection Methods

Data collection was carried out using several approaches to ensure the accuracy and relevance of the system requirements to be developed :

a. Observation

Observation was conducted by directly monitoring operational activities within PT Kharisma Putra Mandiri's business environment.

b. Interview

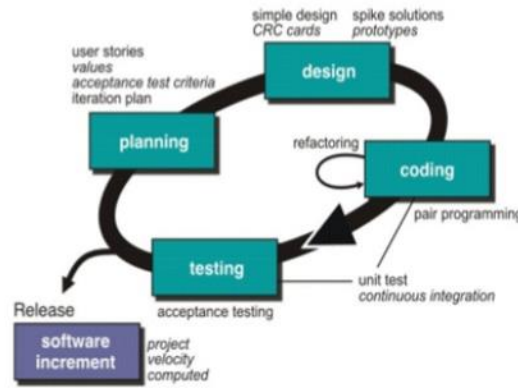
This method involved conducting structured question-and-answer sessions with relevant parties in the company, specifically the owner of PT Kharisma Putra Mandiri.

c. Literature Study

The literature study method involved reviewing a range of sources such as academic books, journals, articles, and credible online references related to the research topic. The review focused on theories concerning software development, information system design, sales management, and the technologies utilized in the proposed system.

2. System Development Model

The system development model employed in this study is Extreme Programming (XP), a branch of Agile Development that emphasizes speed, flexibility, and active user involvement. XP aims to deliver high-quality software in a short time frame while allowing easy adaptation to evolving user requirements (Priandika & Riswanda, 2023). This study adopts the core stages of the XP methodology to support an iterative and responsive system development process (Nurandi et al., n.d.). The primary stages of the Extreme Programming (XP) method applied in this research include the following :



Source:(Wijayanto et al., 2024)

Figure 1.Extreme Programming (XP)

- a. Planning
In this phase, system requirements were identified through direct observation at PT Kharisma Putra Mandiri. The goal of this stage is to understand the business needs and determine the features that will be developed (Priandika & Riswanda, 2023).
- b. Design
The system design was carried out in a simple yet efficient manner, emphasizing functionality and ease of further development.
- c. Coding
The development process was conducted based on the previously defined design. Coding was done iteratively and incrementally, allowing each component of the system to be immediately tested upon implementation.
- d. Testing
Continuous testing was performed during each development iteration to ensure that the system functions according to user requirements and remains free from errors.
- e. Release
Once the system had been fully developed and tested, it was deployed for use by the company to support sales and marketing management activities.

RESULTS AND DISCUSSION

1. Planning

The development of the sales and marketing management information system at PT Kharisma Putra Mandiri began with the software requirements analysis stage. This phase aimed to identify the core functionalities that the system must support to optimally facilitate operational activities in alignment with the company's existing business processes. The system requirements were classified into functional requirements and designed based on the primary user role the administrator. These functional requirements include transaction data management, product management, user account management, and the generation of business reports. The detailed breakdown of the system's functional requirements is presented in Table 1 below :

Table 1. Functional Requirements for Staff

No	Description
A1.	Manage sales data
A2.	Manage purchase data
A3.	Manage product sales details
A4.	Manage product purchase details
A5.	Manage product data
A6.	Manage product categories
A7.	Manage product stock data
A8.	Manage user data
A9.	Manage supplier data
A10.	Manage reports
A11.	Manage system settings

Table 2 Functional Requirements for Customers

No	Description
A1.	View company profile

- | | |
|-----|----------------------------|
| A2. | View products and services |
| A3. | View company projects |
| A4. | View company gallery |
| A5. | View company brands |
| A6. | View contact information |

2. Design

a. Use Case Diagram

This diagram represents the relationship between the system and external actors from a functional perspective, without detailing the technical implementation. The main objective is to provide a concise visual overview of the system's functional requirements and to illustrate how different actors interact with the system in various usage scenarios (Singh, 2022).

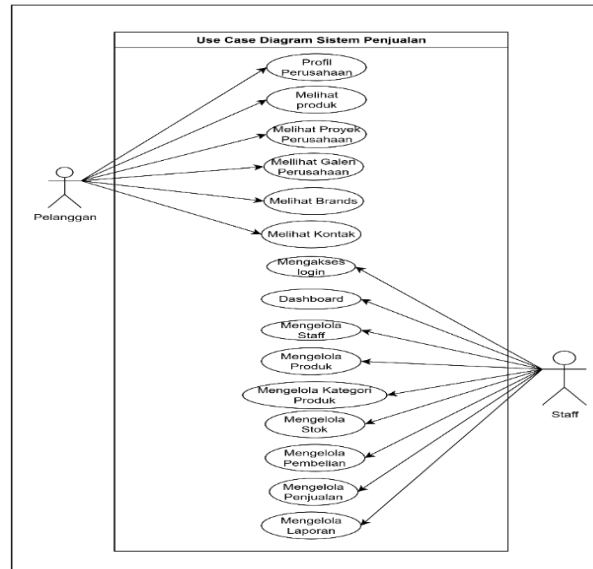


Figure 2. Use Case Diagram of the Sales and Marketing Management System

Figure 2 illustrates the interaction between two types of actors visitors and staff with the sales management system. Visitors can access public information such as the company profile, products, gallery, projects, brands, and contact details. This access is informational only and does not require authentication. In contrast, the staff actor has broader access rights following a successful login, including internal features such as managing staff data, product data, product categories, inventory, purchases, sales, and reports. The diagram serves to clearly and systematically map the system's functionalities based on user roles, thereby facilitating the system development process and the validation of functional

b. Activity Diagram

An activity diagram is a type of behavioral diagram in the Unified Modeling Language (UML) approach that serves to model the sequence of activities within a process whether in a business context or a software system. This diagram emphasizes the flow of actions from one activity to another and illustrates the overall workflow, including decisions, branches, concurrent activities, and the final process that marks the completion of a scenario (Singh, 2022).

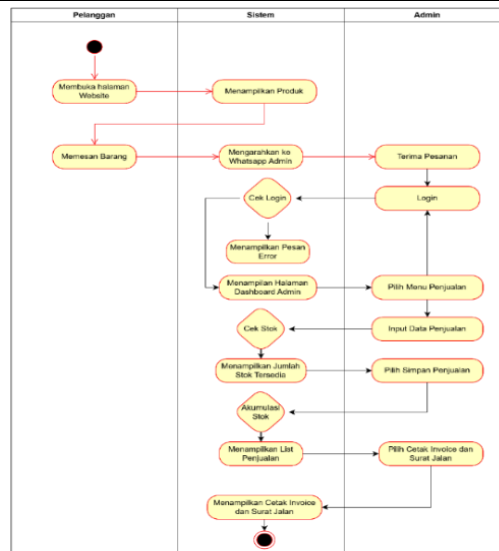


Figure 3. Sales Activity Diagram

Figure 3 illustrates the workflow of the sales process involving three main components the customer, the system, and the admin. The process begins when a customer accesses the website, views available products, and proceeds to place an order, which is then forwarded to the admin's contact. Upon receiving the order, the admin logs into the system, manages the sales data, verifies product availability in stock, and records the transaction in the system.

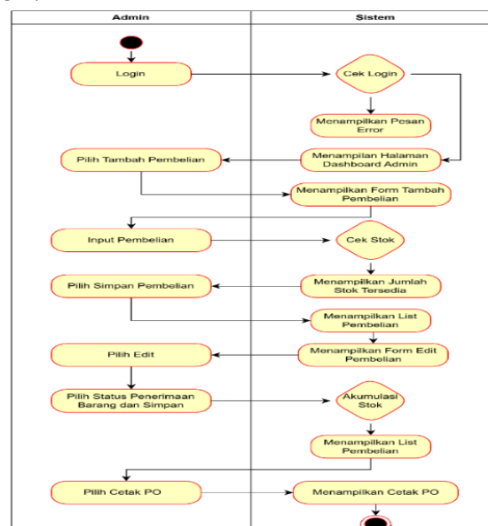


Figure 4 Purchase Activity Diagram

Figure 4 describes the purchase management process carried out by the admin, starting with logging into the system. Upon successful authentication, the admin is able to add purchase data through a designated input form. The system then automatically verifies stock availability as part of the workflow.

c. Component Diagram

The component diagram is used to illustrate the modular structure of the software system as well as the relationships between its components (Sundaramoorthy, 2022).

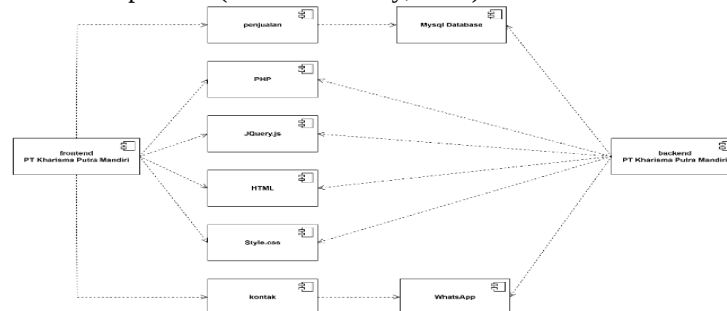


Figure 5. Component Diagram of Sales Management System

Figure 5 illustrates the interaction between components within the system, which consists of both frontend and backend segments. The frontend is developed using scripting languages such as PHP, jQuery, HTML, and CSS, enabling user interaction through a web-based interface. The frontend is connected to the backend, which handles business logic and data processing via a MySQL database. Additional integration features, such as WhatsApp, are also incorporated to enhance communication and operational efficiency.

d. Deployment Diagram

The deployment diagram is a visual representation of the system's physical architecture, illustrating how software components are deployed onto specific hardware nodes (Bagui & Earp, 2022).

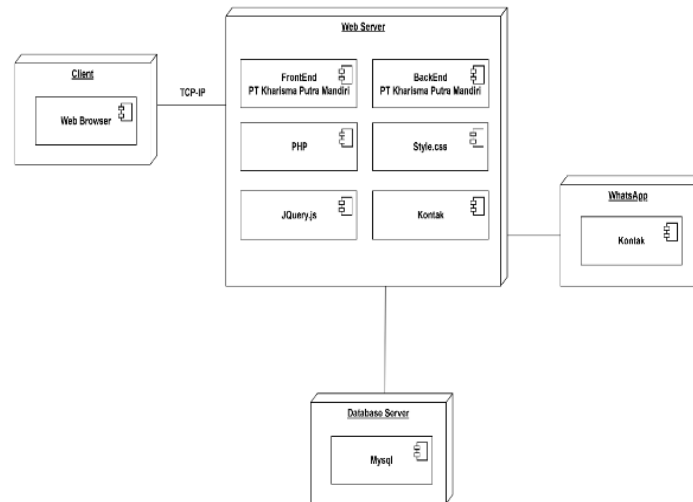


Figure 6. Deployment Diagram of the Sales Management System

Figure 6 presents the deployment diagram that illustrates the relationship between the system's primary nodes: the client, web server, database server, and WhatsApp integration. The web server handles both frontend and backend processing, utilizing technologies such as PHP, jQuery, and CSS, while MySQL serves as the relational database for storing and managing application data.

e. Database

A database is a collection of interrelated data that is systematically organized to facilitate efficient storage, retrieval, and maintenance of information (Elmasri & Navathe, 2021).

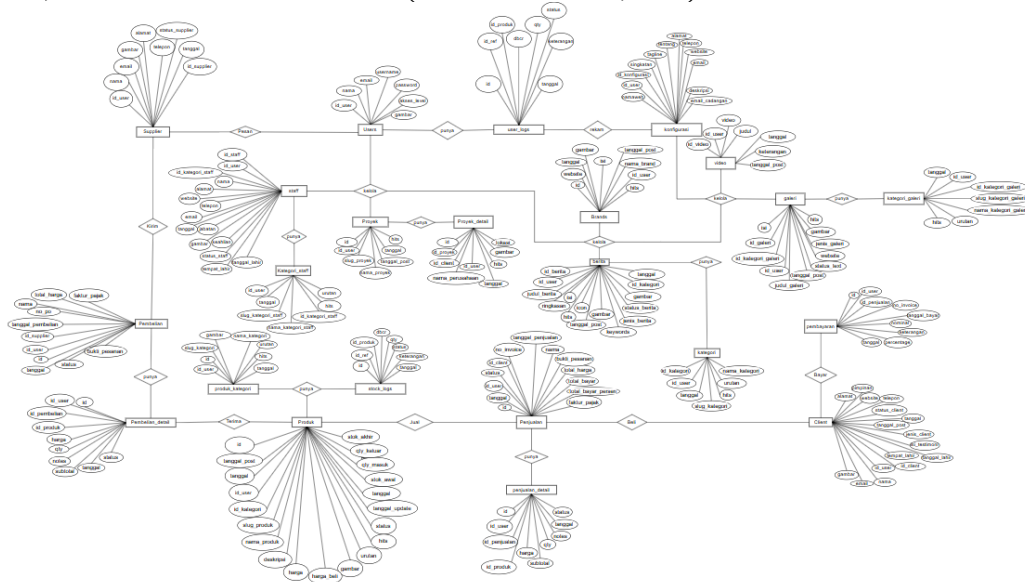


Figure 7. Entity Relationship Diagram

The logical record structure represents an abstract model of the data used within the system, designed to support efficient and consistent information processing. Each entity in the training registration system contains interrelated attributes, organized according to the system's functional requirements.

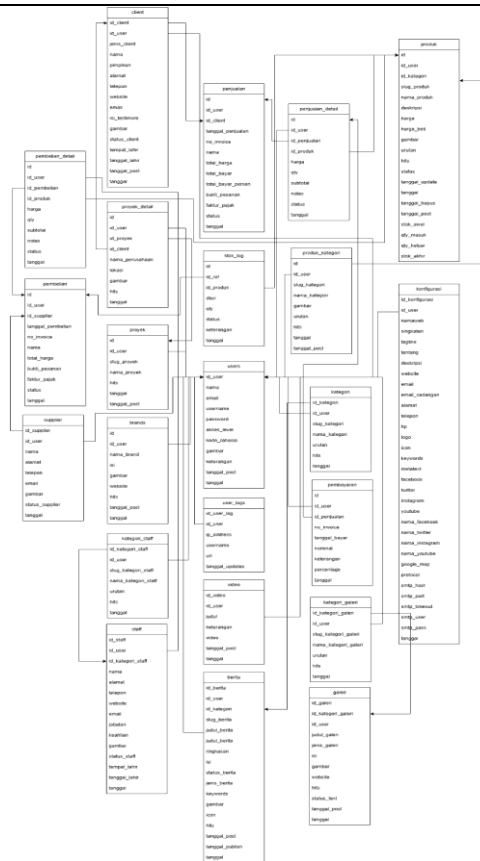


Figure 8.Logical Record Structur of the Sales Management System

3. Coding

The coding phase aims to transform the system design into a fully functional application. Development was carried out iteratively using the Extreme Programming (XP) methodology, which emphasizes collaboration, rapid feedback, and continuous improvement (Priandika & Riswanda, 2023). The system was developed using PHP with the CodeIgniter 4 framework, and MySQL was employed as the database management system to support data handling and storage functionalities (Supono & Putratama, 2016).

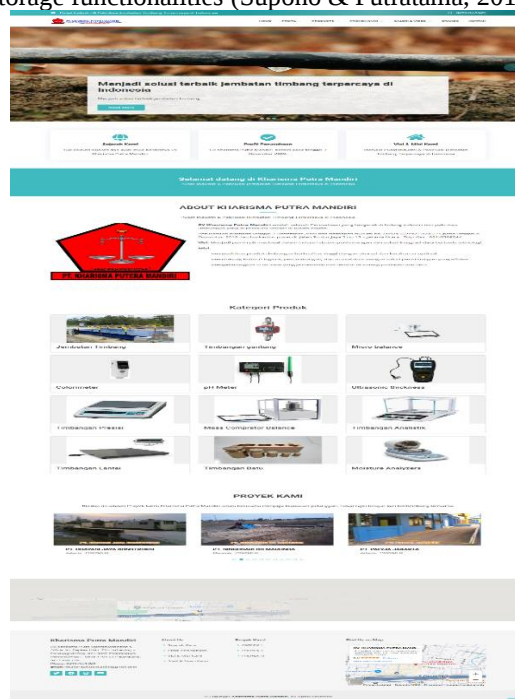


Figure 9. Home Page Interface

Figure 9 displays the Home page of the Kharisma Putra Mandiri website, which serves as the main landing

page and the initial point of information for visitors. This page contains several key components that are designed to be both informative and well structured, providing users with a clear and accessible overview of the company's offerings and identity.

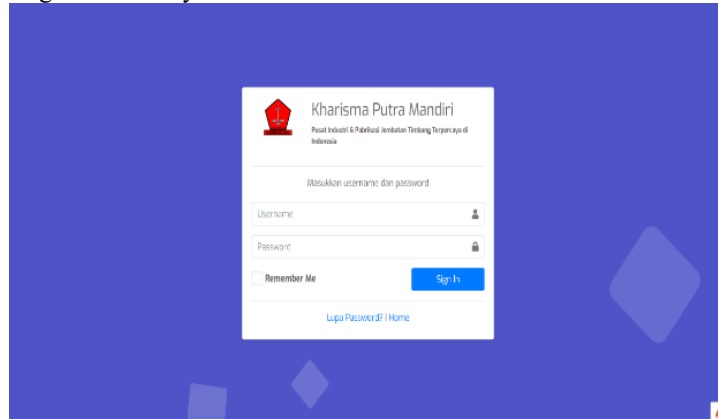


Figure 10 Login Page Interface

Figure 10. presents the login interface designed for administrators and staff members of the company. This page serves as the entry point for authorized personnel to access and manage the company's business operations through the internal system.

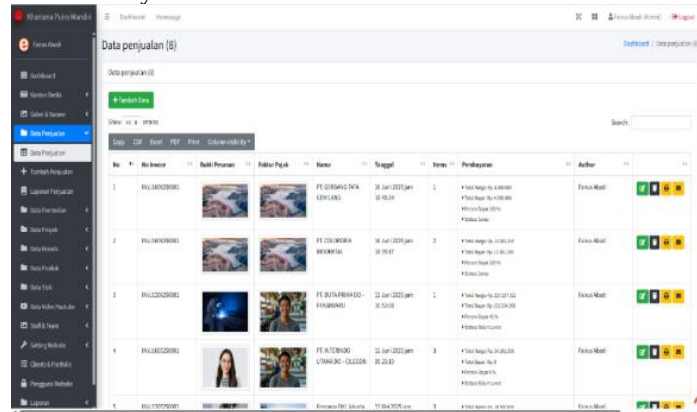


Figure 11 Sales Page Interface

Figure 11. illustrates one of the system's core features, which is used to display all sales transaction data in a structured and interactive manner. This interface enables staff to efficiently manage, monitor, and review sales activities through a user-friendly and organized layout.

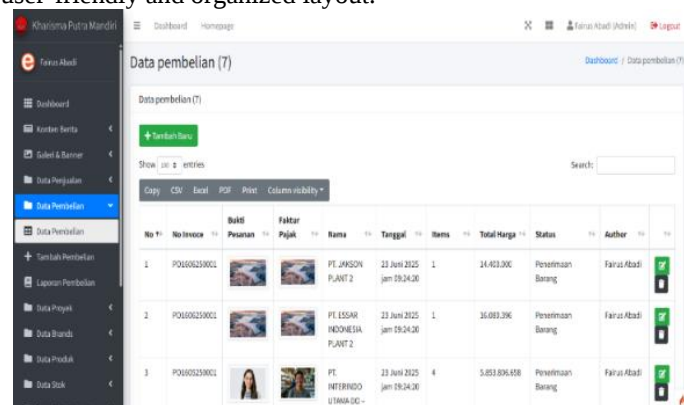


Figure 12 Purchase Page Interface

Figure 12 shows the Purchase Data page, which is used to manage all product procurement transactions carried out by the company. This interface supports efficient handling of purchase records and serves as a central point for tracking procurement activities.

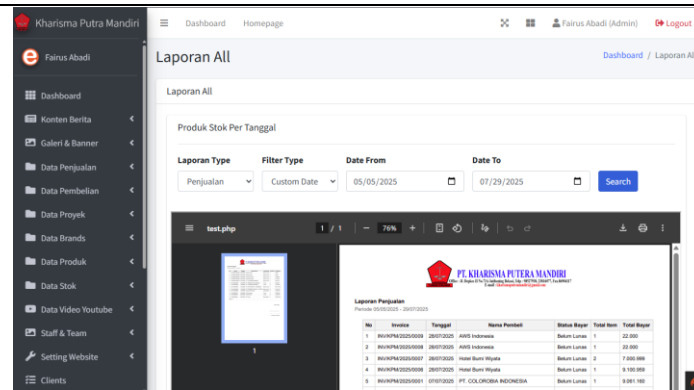


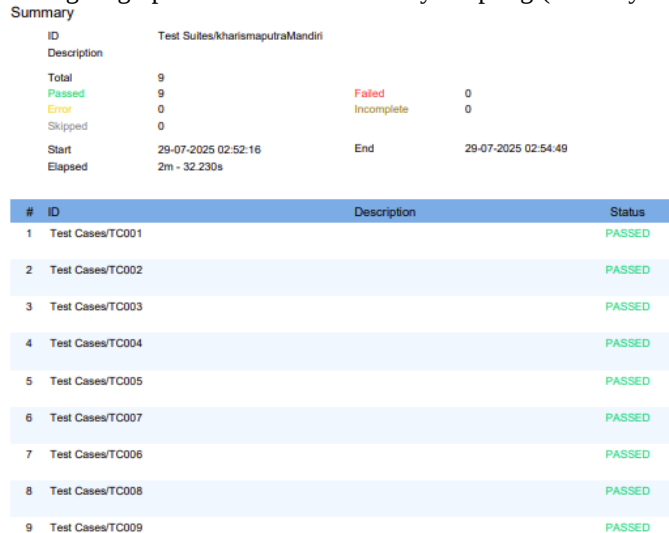
Figure 13 Report Page Interface

Figure 13 displays the report page within PT Kharisma Putra Mandiri's information system. This interface is used to generate and view reports on sales, purchases, and product stock, filtered by specific date ranges. It provides users with structured and timely data to support decision making processes.

4. Testing

a. Functional Testing

Functional testing is conducted to ensure that each feature of the system performs according to its defined specifications by validating both input and output operations (Majeed et al., 2021). The testing process utilized Katalon Studio, a tool that supports automated GUI and API based testing, enabling the efficient creation of test cases through a graphical interface or Groovy scripting (Nurcahyani & Suyatno, 2023).



Functional testing of nine test scenarios confirmed that all system features and workflows operated as expected. All test cases (TC001–TC009) returned a PASSED status with no errors encountered.

b. Performance Testing

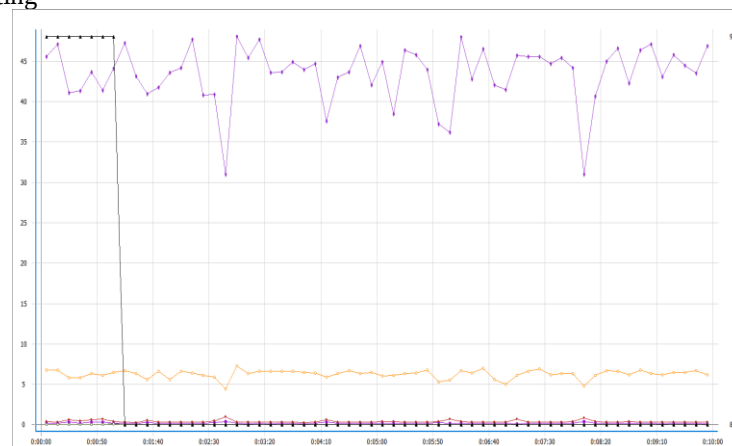


Figure 14. Performance Testing

The performance testing results indicate that most modules such as Product Management, Category, User,

Sales, and Purchase achieved response times under 0.5 seconds, meeting the threshold for good performance standards (WAPT, 2003). The Login module recorded the highest response time, with an average of 1.71 seconds and a maximum of 4.13 seconds, suggesting a need to optimize the authentication process (Anggi Puspita et al., n.d.). The Report module achieved the lowest response time, but failed to load the page properly, making the result unrepresentative. Overall, the system demonstrated good response performance, although improvements are needed in login processing and report stability (Nurcahyani & Suyatno, 2023).

CONCLUSION

The developed system successfully automated core business processes, including transactions, data management, and operational reporting. UAT testing confirmed that all features functioned properly without significant issues. The use of the Extreme Programming (XP) method enabled incremental system refinement based on user feedback. In terms of performance, most modules responded within 0.5 seconds, with the exception of the login module, which requires optimization. Although the reporting module was the fastest, it exhibited display instability. Overall, the system demonstrated solid performance and is suitable for further development.

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