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Web-Based Inventory System Design Using Rapid Application Development Method at PT. ALFA SCORPII

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Abstract

This study designs a web-based inventory system for PT. Alfa Scorpii using the Rapid Application Development (RAD) method. The previous manual system led to data errors and slow processes. The new system features real-time recording, multi-level approval, and role-based access management. Implementation results show improved accuracy and efficiency. This paper discusses the RAD stages, system design, and suggestions for future development. The web-based inventory system at PT. Alfa Scorpii using the RAD method improves the efficiency and accuracy of inventory management.

Keywords: *Inventory System, RAD, Web-Based System*

1. Introduction

PT. Alfa Scorpii, engaged in the distribution and sale of motor vehicles, faces challenges in inventory management due to the current manual system. This manual system causes various problems, such as recording errors, difficulties in real-time item tracking, and obstacles in the decision-making process. This affects operational efficiency and inventory data accuracy.[1] In today's digital era, web-based information technology offers more efficient and effective solutions. Web-based systems enable real-time item tracking, automate recording processes, and provide more structured data management. This can reduce manual errors and improve data access speed. Therefore, this study aims to design and develop a web-based inventory system using the Rapid Application Development (RAD) method. The RAD method was chosen for its flexible and fast nature, allowing the development of a system that can adapt to user feedback and changing requirements iteratively. With the implementation of this new system, it is expected to improve inventory management efficiency and provide better visibility of user-required items at PT. Alfa Scorpii

2. Theoretical Foundation

2.1. Inventory

Inventory is the activity of recording and managing company assets to ensure proper documentation and optimal utilization. Its functions include asset monitoring, supporting operational efficiency, cost control, and providing accurate data for financial reporting.[2]

2.2 Web-Based Information System

A web-based information system is an application that uses web technology to manage and present data in real-time. Advantages include accessibility from various devices, scalability, maintenance efficiency, and support for user collaboration.

2.3 Rapid Application Development (RAD)

RAD is a software development methodology emphasizing flexibility, speed, and user involvement. Its phases encompass requirements planning, user design, construction, and cutover. This approach enables rapid and adaptive system development through iterative cycles and prototyping.[3]

3. Research Methodology

The research methodology follows the Rapid Application Development (RAD**)** system development method.

3.1. Rapid Application Development (RAD)

I propose the **RAD methodology** because it offers programmers flexibility and accelerated development. Below are the reasons for using RAD for PT. Alfa Scorpii's web-based inventory system:

1. **Flexibility**: RAD accommodates changing requirements during development through prototype iterations.
2. **Speed**: Faster development via early prototyping and immediate testing.
3. **User Collaboration**: Early stakeholder involvement ensures alignment with operational needs.
4. **Modular Suitability**: Ideal for inventory modules (stock management, item transactions, reporting) developed incrementally with real-time testing.

Fig. 1: Rapid Application Development

Diagram of the RAD system development process:

1. **System Development Plan**: Initial planning to identify user requirements, system objectives, technical specifications, features, and timelines.
2. **Website Design**: Creating wireframes, layouts, and visual elements to outline the website's interface and functionality.
3. **Design Testing**: Simulating/testing designs in controlled environments to validate user needs and rectify errors.
4. **Program Development**: Coding and system integration based on approved designs.
5. **Publication**: Deploying the finalized system/website for public or target-user access.

4. Results and Discussion

This system simplifies staff tasks in recording, repair requests, and item disposal.**Inventory Website System**
The inventory website includes tracking features, user management, item recording, request handling, repairs, and disposal. Below are the details:
1. The Dashboard page displays a table of requests that require approval and provides a tracking feature to monitor the progress of pending requests.

Fig. 2: Dashboard

2. This page functions to list all items along with their item codes.

Fig. 3: Inventory Table

Below is an example of adding a new item:

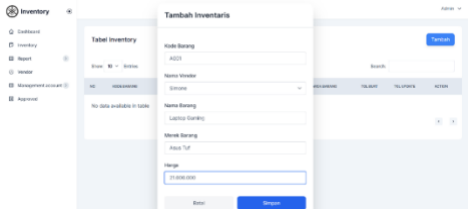

Fig. 4: Inventory Item Addition Form

3. On this page, the admin can record and display all items requested by users, with specific rules for requests that exceed a certain price threshold.

Fig. 5: Request Table

This page is used to log all user data and the items requested, and to process the request.

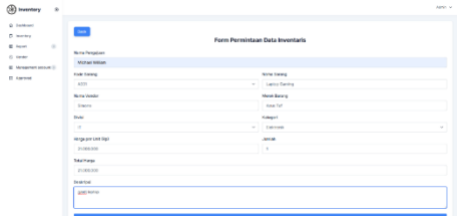

Fig. 6: Inventory Request Form

Below is an example of a request input that requires approval.

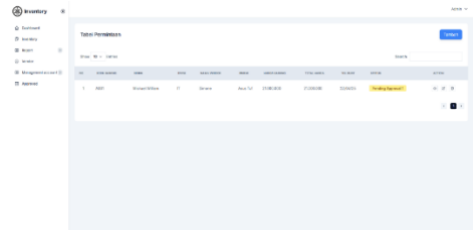

Fig. 7: Pending Approval

This shows a detailed request that needs to be approved by the authorized admin.

Fig. 8: Item Request Detail

4. This page is used by the admin to record damaged items that need to be sent to vendors for repair.

Fig. 9: Repair Table

The repair form is used to report and document damaged inventory items that need repair.

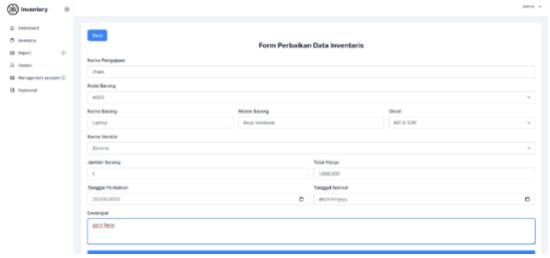

Fig. 10: Repair Form Example

The repair table displays data automatically approved by the system, but authorized users can modify, delete, or reject approval if discrepancies or errors are found.

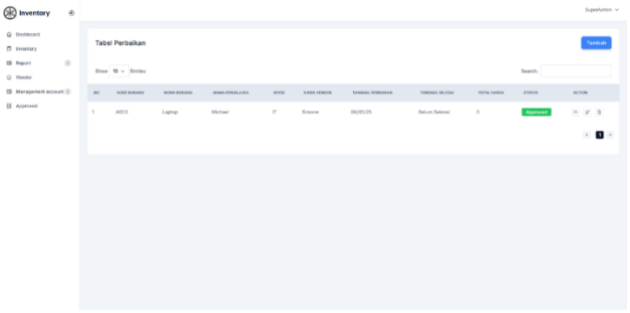

Fig. 11: Repair Table with Example Data

The item repair detail page displays all item details, including item code and description, and allows users to reject entries if needed.

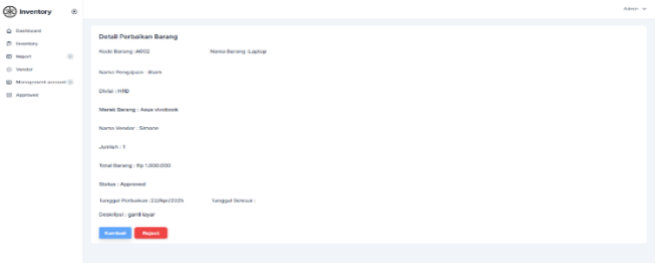

Fig. 12: Repair Item Details

5. This page allows monitoring of items to be sold or destroyed, including irreparably damaged items.

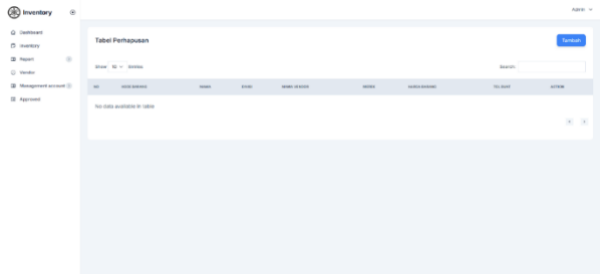

Fig. 13: Disposal Table

Below is a form used to input disposal data for items no longer in use.

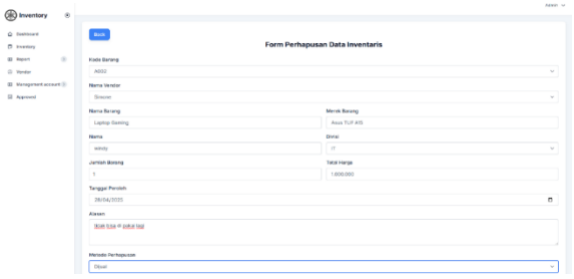

Fig. 14: Disposal Form

On the Disposal Table page, submitted data is displayed in a table.

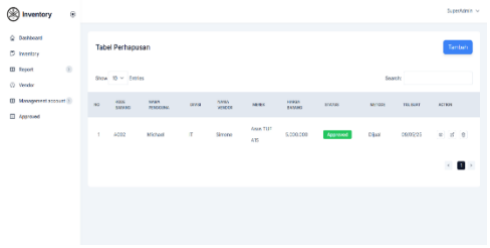

Fig. 15: Disposal Table with Data

This table also stores vendor data, including name and address, and includes an input modal to add or edit vendor entries efficiently and accurately.

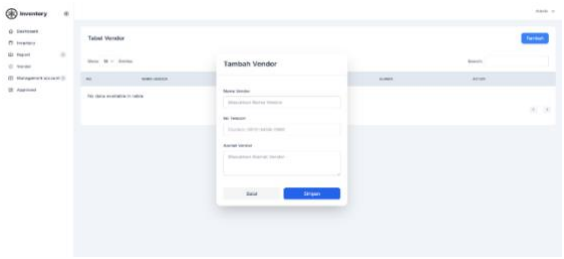

Fig. 16: Vendor Table with Modal Form

A user management modal is available for adding admin users who can access the website.

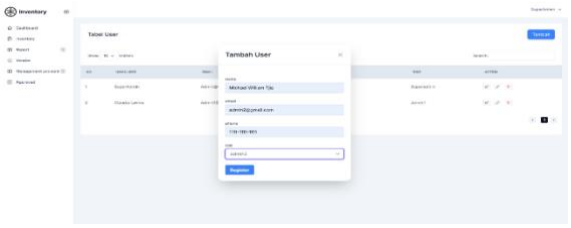

Fig. 17: User Modal Form

This page displays the status of all forms—pending, approved, or rejected.

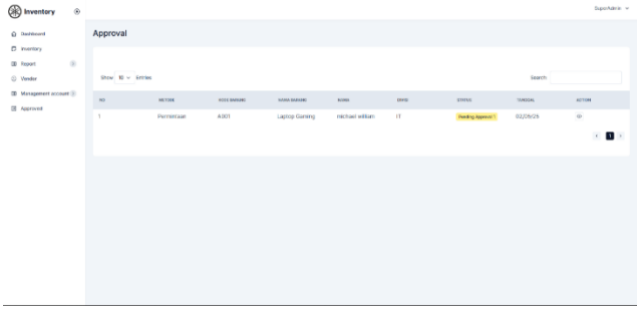

Fig. 18: Approval Table

The admin approval page is used to approve user requests. If the budget is exceeded, a second level of approval is required.

Fig. 19: Sample Page Requiring Approval

After both the first and second approvals are granted, the interface will look like this

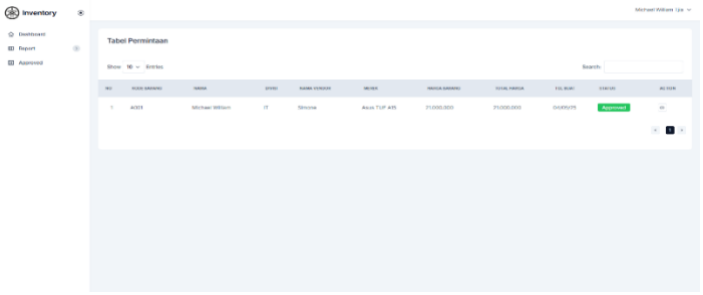

Fig. 20: Final Approved Page

Discussion

The system used has advantages such as an automatic input form that speeds up data entry, an approval menu for document monitoring, and access rights settings for security. However, the system also has shortcomings, such as the absence of a permanent database, resulting in manual database creation that risks data inconsistency. Additionally, item codes are entered manually without an automated system or database reference, which can lead to input errors and slow down the data entry process.

5. Conclusion and Suggestions

The web-based inventory system at PT. Alfa Scorpii using the RAD method improves the efficiency and accuracy of inventory management. Suggestions for future development include: adding an auto-generated item code feature, implementing a permanent database, developing dynamic reports, testing the system in a real operational environment, and providing user training.

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