Instal : Jurnal Komputer

E-ISSN: 2808-683X
Edisi : Volume 16 Nomor 05 | December 2024

Available online at https://journalinstal.cattleyadf.org/index.php/Instal/index

DESIGN AND CONSTRUCTION OF APPLICATION FOR SUBMISSION AND USE OF MEDICAL DEVICE NEEDS (Case Study of MITRA MEDIKA BANDAR KLIPPA HOSPITAL) USING PROTOTYPE METHOD

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ARTICLE INFO

Keywords:

Application Submission,
Medical devices,
Hospital,
Logistics,
Work Efficiency.

ABSTRACT

This study aims to design a web-based application that supports the process of submitting and using medical device needs at Mitra Medika Bandar Klippa Hospital. This application is designed to make it easier for logistics admins to manage medical device stock, including adding and removing goods, and to make it easier for medical staff to submit device requests and monitor their submission status. The methodology used involves system requirements analysis, design, implementation, and system testing using the Black Box Testing method. The test results show that all application features, such as stock management, report printing, and submission status monitoring, function properly without any errors. User surveys show a satisfaction level of 75%, indicating that this application is effective in improving the efficiency of medical device management in hospitals..

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INTRODUCTION

Mitra Medika Bandar Klippa Hospital is one of the health facilities that has an important role in providing quality medical services to the community. As one of the public health service facilities that continues to grow, Mitra Medika Bandar Klippa Hospital strives to always improve the quality of health services through various innovations and improvements to the operational system. One important aspect in hospital operations is the management of the need for appropriate and efficient medical devices. The use of appropriate medical devices that are available at the right time greatly affects the effectiveness and efficiency of the health services provided. However, the manual process of submitting and using medical devices often causes various obstacles, such as delays in fulfilling the required medical devices, errors in inputting usage data, and incompatibility of medical devices with medical needs. This condition not only hinders the smooth operation of the hospital but can also have an impact on the quality of services provided to patients. (Lestari, et al., 2021) At Mitra Medika Hospital

Bandar Klippa Previously, the process of submitting and requiring medical devices was still manual, such as staff who wanted to submit medical devices every Monday had to come in person and record requests for medical devices with receipts provided by logistics employees. The hospital logistics department collects all receipts from all divisions that submit medical device needs and then processes which ones will be approved first. In an effort to overcome this problem, designing an application for submitting and using medical devices based on information technology is very relevant. This application is expected to automate the process of submitting, fulfilling, and monitoring medical devices so as to increase efficiency and data accuracy. The method used in designing this application is the prototype method. This method was chosen because it allows developers to produce an initial model of the application that can be tested and evaluated by users. This is in line with research conducted by (Aprilia, et al., 2024), 2 which states that "the prototype method allows for better interaction between developers and users, accelerates development iterations, and ensures that the resulting system is more in line with user needs". Thus, designing a website-based application using the prototype method is expected to provide an effective and efficient solution in managing medical devices. In the process, this application is expected to not only increase the speed and accuracy of the submission and use of medical devices, but also improve the overall quality of health services. In this study, the author used the prototype method to design an application system for submitting and using medical device needs. Prototype is a widely used system development technique and this technique also provides facilities for developers and users to interact with each other during the creation process, so that developers can easily model the software to be created. Prototyping goes through five processes, namely communication, quick plan, quick design, prototype construction and delivery & feedback (Kurniati, 2021). Because using the prototype method is expected to make it easier for users to choose the appropriate system from what the user has expected. The main purpose of the prototype is to develop a model or system design into a final one that can meet user requests. In the system development process, users can take part in the development process by evaluating and providing feedback. The process is intended to convert various abstract properties of an idea into something more tangible or visible resembling the actual results. In this process, it is not only a visualization of ideas but also a process of building ideas. Based on the background that has been explained previously, the author tried to conduct research with the title "Design and Construction of Application for Submission and Use of Medical Device Needs (Case Study of Mitra Medika Bandar Klippa Hospital) Using the Prototype Method."

METHODS

The prototype method is a system development approach that involves creating a model or early version of the system to be built. The goal is to get feedback from users early on so that system development can be tailored to user needs. data that will gradually be taken from the Higher Education Database (PD-Dikti) which contains the achievement of performance indicators of the study program management unit (UPPS) as the proposer unit for study program accreditation (APS), as well as accredited study programs. This indicator was prepared by

Prototype Method

The prototype method is an approach in information system development that involves creating an initial model or prototype of the desired system. This prototype serves as a temporary representation of the actual system and is used to identify needs and problems that may arise. According to Jogiyanto (2005), the prototype method allows developers and users to work closely together, thereby minimizing errors and improving the quality of the resulting

system. This prototype is then refined through a series of iterations based on feedback from users until it reaches the desired final form.
The prototype method usually involves several main stages, namely:

1. Identify User Needs: This initial stage involves gathering information about user needs and wants. Developers discuss with users to understand what functions are expected from the system.
2. Initial Prototype Creation: Based on the identified needs, developers create an initial prototype that serves as a temporary model of the system. This prototype includes only the main features and is created quickly so that it can be tested immediately by users.
3. Prototype Testing and Evaluation: Users try out the prototype and provide feedback on its functionality and design. This feedback is critical to identifying deficiencies and areas for improvement.
4. Prototype Refinement: Based on user feedback, developers refine and refine the prototype. This process is repeated several times until the prototype reaches the form desired by the user.
5. System Development and Implementation: After the prototype is approved by the user, the developer begins the final system development phase by referring to the prototype as the main reference. The finished system is then implemented and thoroughly tested before being officially used.

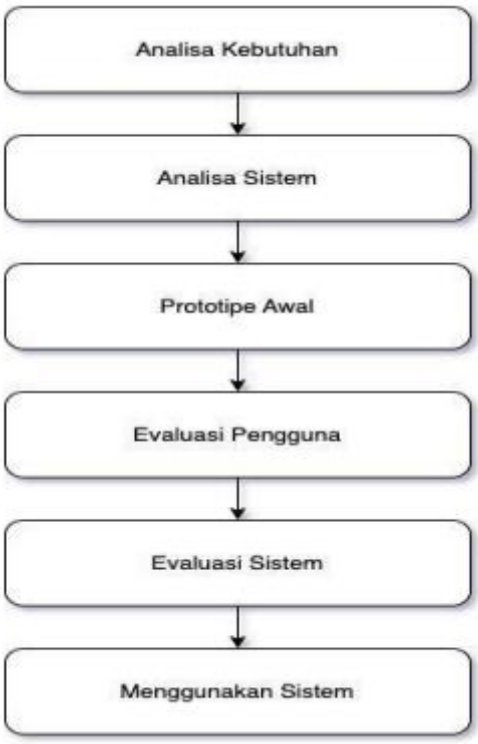

Figure 1. Prototype Method Stages

Data analysis

Data analysis is an activity to analyze the types of data needed by the web-based field information system designed in this study. At this time it will be carried out with the following stages:
1. Identify the main needs of Medical Staff and Staff in Hospital Logistics.
2. Conduct interviews and supervision to understand the procedures for submitting and collecting goods at Mitra Medika Hospital.

System Design Methods

In designing this information system, the author uses the prototype method in its implementation. The prototype method is a method used in software development by utilizing the initial design of the product, system, or design being designed. Prototype creation is very important to test and validate the concept of a product or system before developing further. This initial prototype may not have all the planned features, but its purpose is to provide a basic overview of how the product or system will work. This approach was chosen because of its ability to facilitate users to test system prototypes directly, provide feedback that can be implemented quickly, and accommodate changing needs efficiently.

Needs analysis

1. Problem analysis.

Mitra Medika Bandar Klippa Hospital experienced obstacles in its logistics management, characterized by slow manual processes, minimal visibility of stock, inaccurate data, and ineffective communication between departments. This resulted in inefficiency and potential problems such as excess or shortage of stock, as well as delays in ordering and distributing goods.

2. Solution to problem

Mitra Medika Bandar Klippa Hospital can overcome its logistics constraints by designing an integrated logistics information system. This system is designed to automate manual processes, improve inventory visibility, improve data accuracy, and facilitate communication between departments. The implementation of this system is expected to increase efficiency, minimize errors, and smooth the logistics process in the hospital.

System Design

System Design in Information System Design is the process of designing a blueprint of an information system to be built. This stage is very crucial because it will determine how the system will function, interact with users, and achieve the goals that have been set. In designing this information system, several system design processes are applied, as follows.

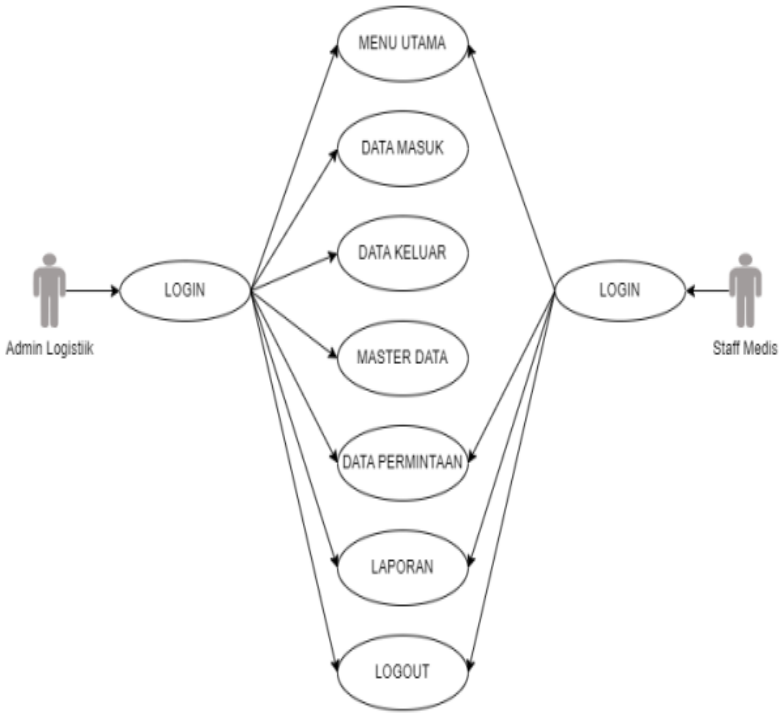

Figure 2. Use Case Diagram of Medical Device Website

The main actor is the Medical Staff, who can perform actions such as submitting a request for a specific medical device, using the medical device according to the amount they need, and generating a report that records the use of the device and the number of items taken from stock. This diagram facilitates efficient interaction between the Medical Staff and the hospital information system, ensuring accurate inventory management and adherence to prescribed procedures for the use of items.

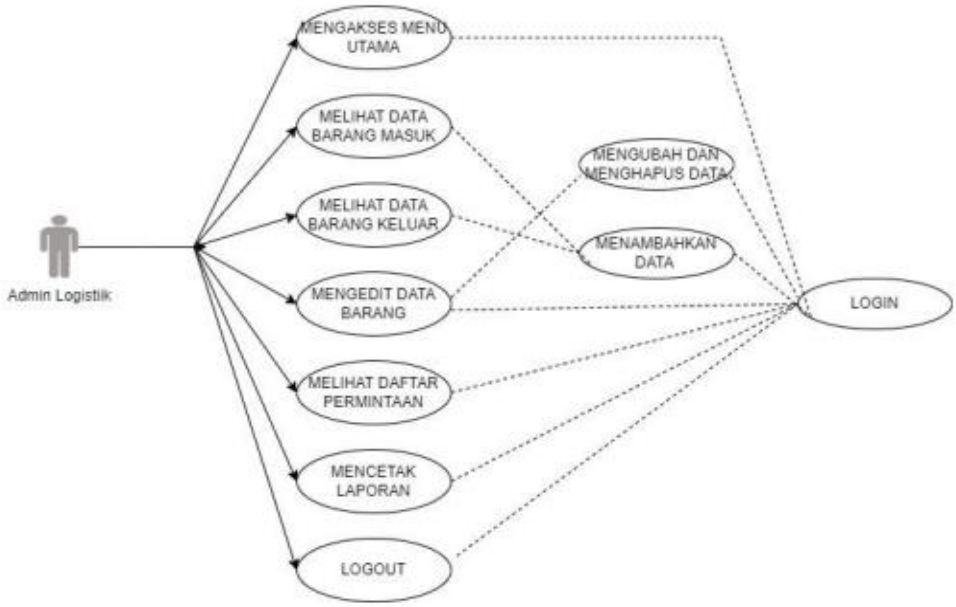

Figure 3. Logistics Admin Use Case Diagram

Logistics admin can perform various activities such as login, view incoming and outgoing goods data, manage goods data, view request lists, print reports, and logout. In simple terms, this diagram shows all the tasks that a logistics admin can do in this system to manage goods data.

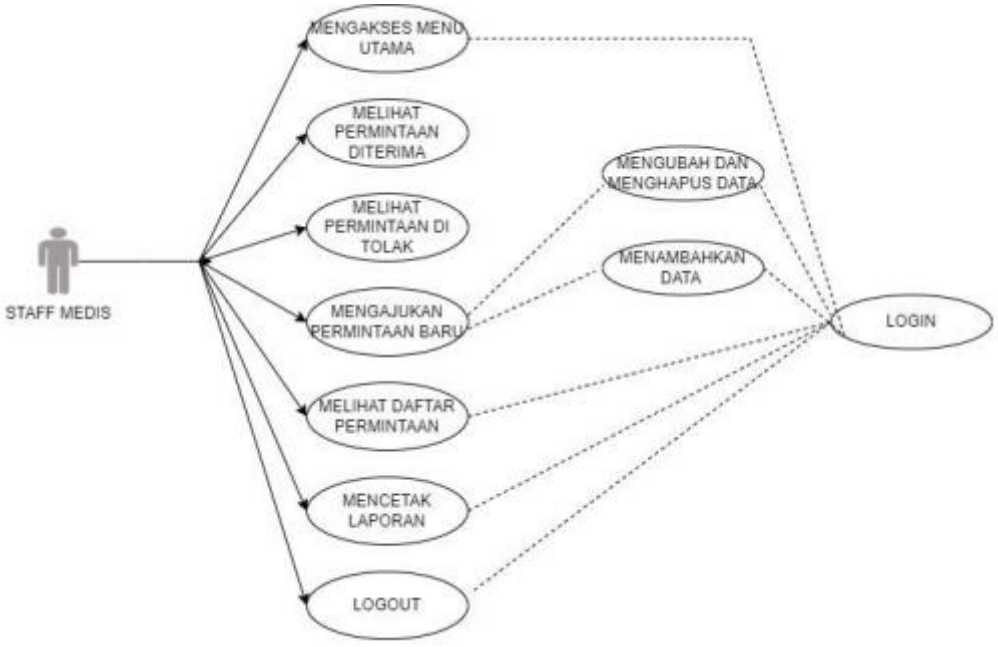

Figure 4. Medical Staff Usecase Diagram

RESULTS AND DISCUSSION

At this stage, the design and implementation of the application for submitting and using medical device needs at Mitra Medika Bandar Klippa Hospital has been carried out. This application consists of two main interfaces, namely the interface for logistics admin and the interface for medical staff.

a. Login Page

Users must log in to the system using their registered username and password. The system will verify according to their role, either as a logistics admin or medical staff..

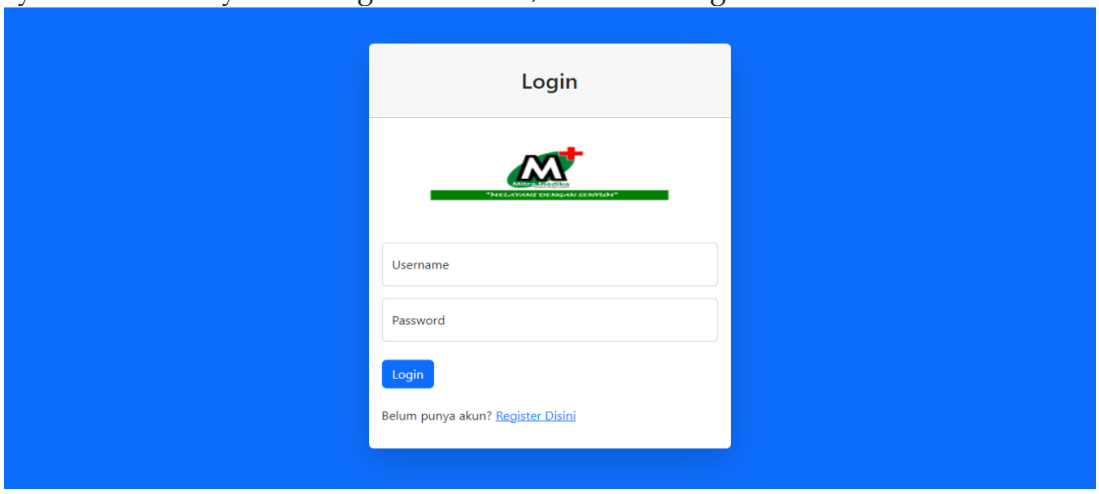

Figure 5. Login View

b. Register View

New users can register themselves through the registration page. Later, they will be automatically selected by the system based on the role they registered.

Figure 5. Register View

c. Logistics Admin Dashboard Page

Displays stock summary, access to unprocessed requests, and submission reports.

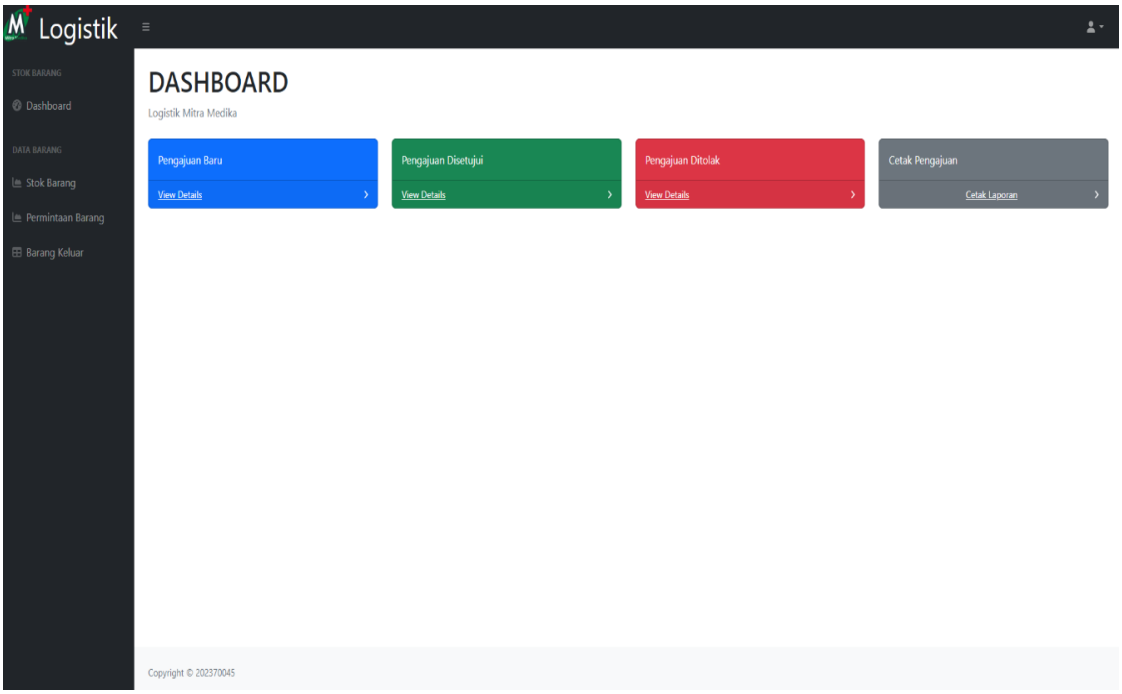

Figure 6. Logistics Admin Dashboard View

d. Stock List Page

Displays a summary of stock items, recorded in warehouse data, according to quantity, type and description.

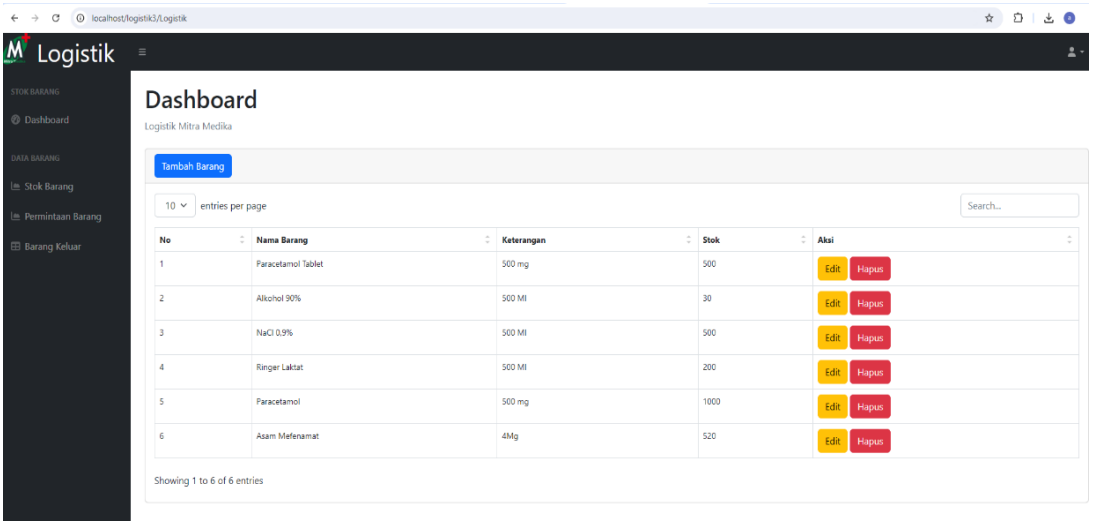

Figure 7. Tampilan Daftar Stok Barang

e. Display of Incoming Goods Addition

Logistic admin can add new stock or update existing stock by recording the addition date.

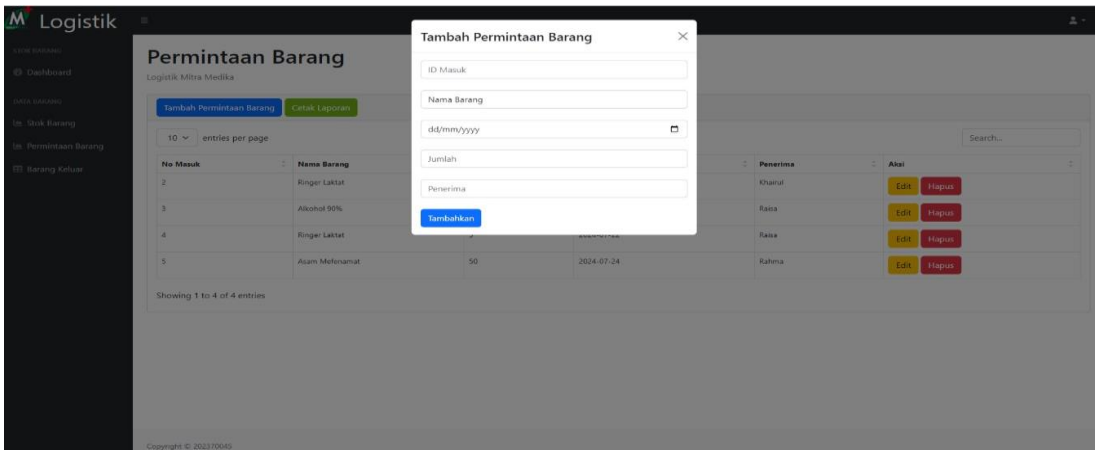

Figure 7. Display Added Items In

f. New Request View

Display new requests based on requests from logistics staff with 70 clear recipient names and submission dates. Logistics admin can also change the status of accepted or rejected

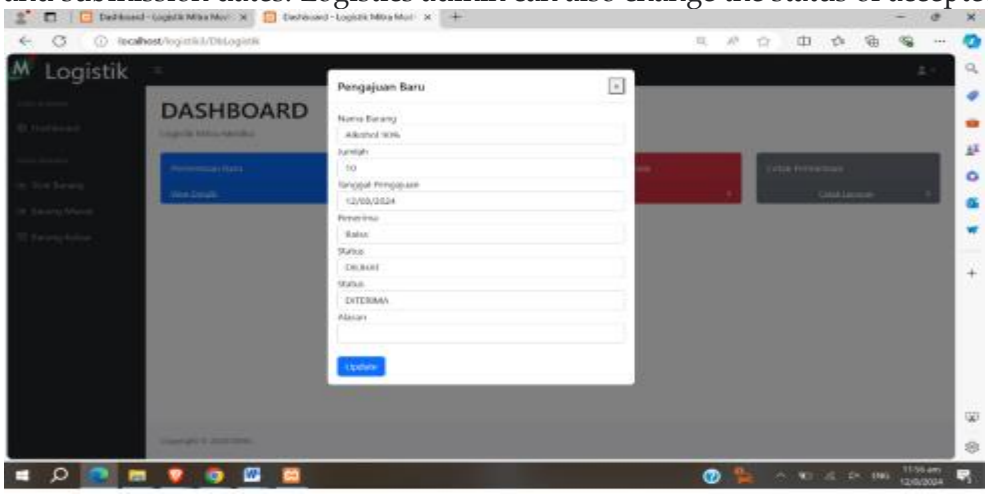

Figure 8. New Request View

g. Approved Request View

Data on requests for goods by medical staff with approved status are collected on one page, to facilitate recording and printing of reports

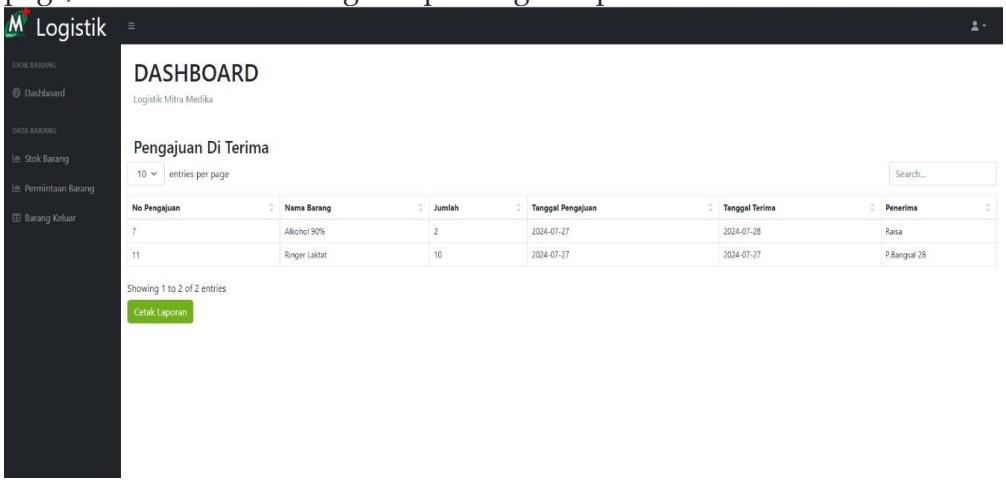

Figure 9. Approved Request View

h. Request Rejected View

Data on requests for goods by medical staff with rejected status are collected on one page, to facilitate recording and printing of reports. The table displayed also shows the reasons for rejection.

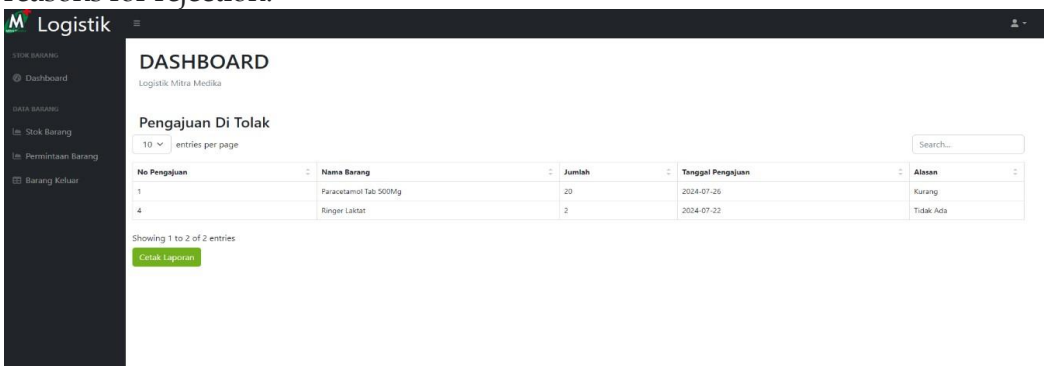

Figure 10. Request Rejected View

i. Outgoing Goods Management Page

On this page, the admin can input data on goods to be issued based on demand and quantity. Later, the stock of goods will be updated immediately after the input of outgoing goods is completed.

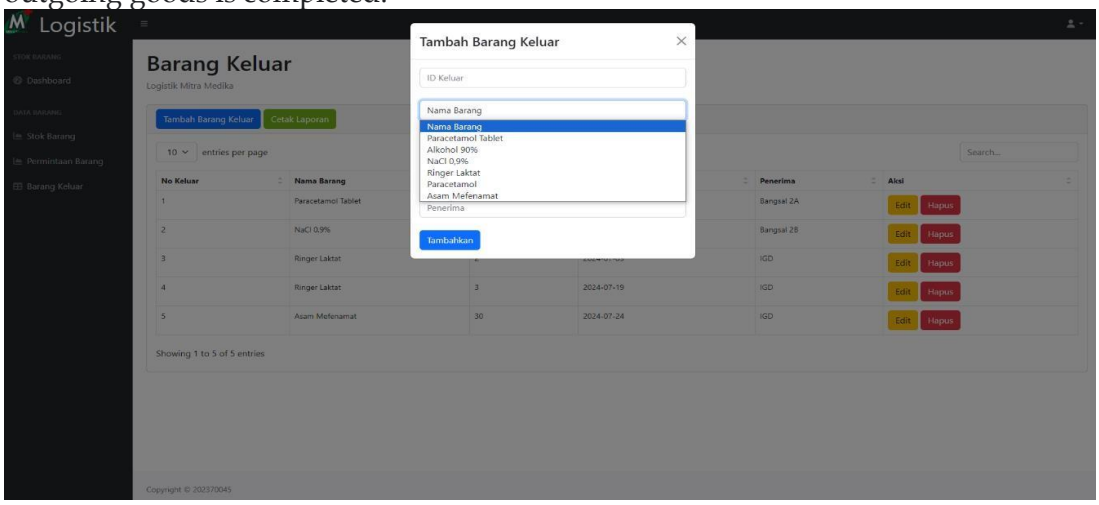

Figure 11. Outgoing Goods Management View

j. Print Report Page

Admin can print complete reports on stock, incoming and outgoing goods, and history of requests for goods by medical staff.

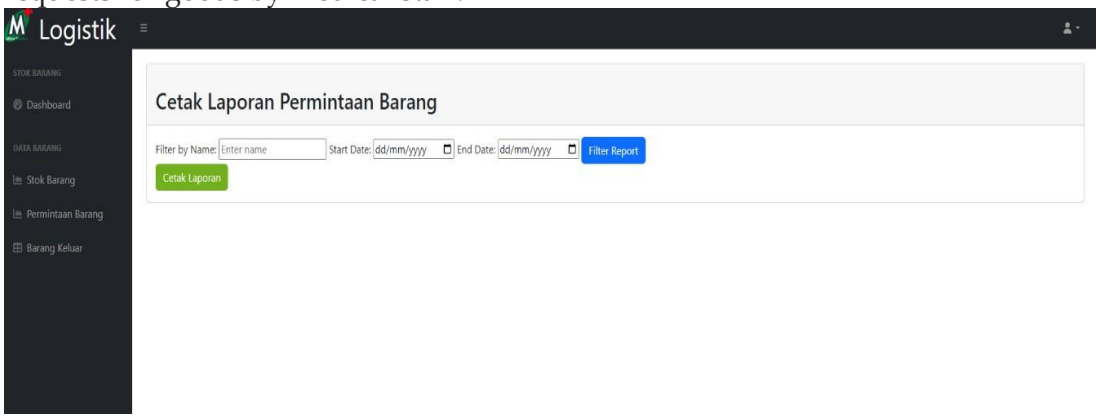

Figure 12. Print Report Page View

k. Medical Staff Dashboard Page

Displays the main page when medical staff successfully logs into the system. Displays Submissions and a list of submitted submissions.

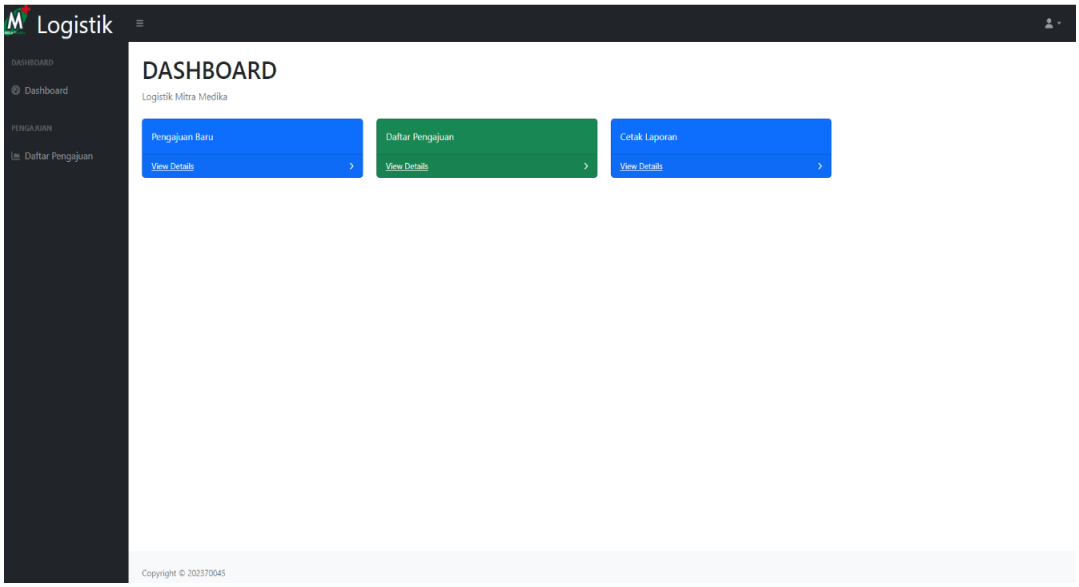

Figure 13. Medical Staff Dashboard View

l. Item Request Page

Medical staff can submit a request for medical devices to the logistics department. The items requested must be items on the logistics list.

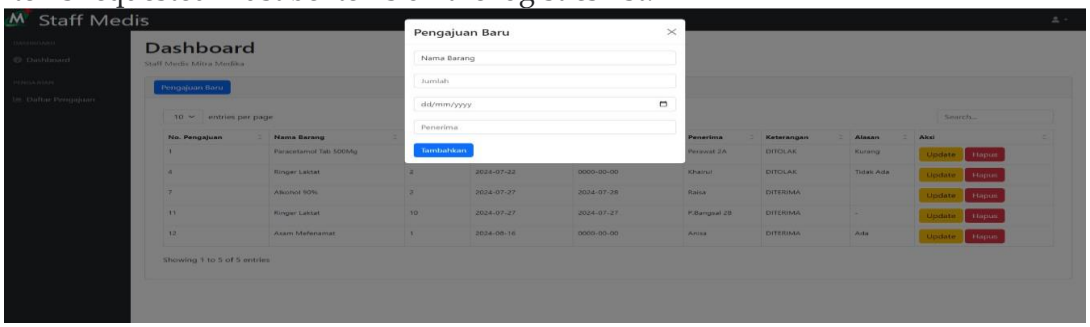

Figure 14. Tampilan Permintaan Barang

m. Request Status Update Page

Logistics admin can change the status of the goods request submitted by the medical staff, for example from "Processed" to "Completed" or "Rejected". This status change will be immediately visible to the medical staff through their interface.

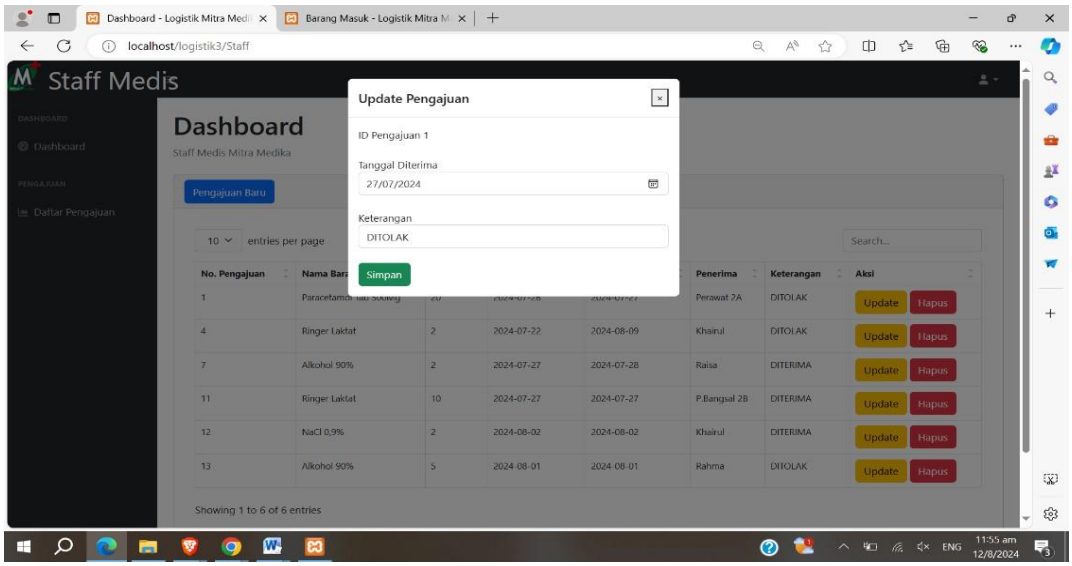

Figure 15. equest Status Update View

Discussion

This application is designed to simplify the process of submitting and using medical device needs at Mitra Medika Bandar Klippa Hospital. With the addition of stock features, management of incoming and outgoing goods, and printing reports, logistics admins can manage medical devices more efficiently and accurately. To maintain data security, this application is equipped with login and registration features. Only authorized users can access and use this application. In addition, the real-time request status update feature provides high transparency in the process of fulfilling medical device requests. The login and register features ensure that only authorized users can access the system, and the request status update feature provides more transparency in the fulfillment process. Medical staff who previously had to manually request goods can now make requests directly through the application, which can then be monitored for their status. This increases transparency and speeds up the process of fulfilling medical devices. Test results show that this application meets user needs and is able to improve work efficiency in the hospital environment. With an estimated user satisfaction rate of more than 97%, this application is considered quite successful in providing solutions for medical device management. This application not only improves work efficiency, but also provides other benefits such as reducing the risk of errors in managing medical device data. With an integrated system, information regarding the availability of medical devices is always updated so that shortages or excess stock can be avoided.

CONCLUSION

This application has successfully met the needs of hospitals in terms of managing medical devices, with features that allow logistics admins to add stock, manage incoming and outgoing goods, and print reports effectively, The feature of requesting goods by medical staff accompanied by monitoring the status of requests provides convenience and transparency in the process of fulfilling medical devices, The test results show that this application functions well, and the level of user satisfaction reaching more than 97% indicates that this application is well received by users, Producing a data management system that can help the Bandar Klippa Medika partner hospital in managing its equipment inventory, The design of this equipment submission application system uses the HTML, PHP programming languages and MySQL database.

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