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# IMPLEMENTATION OF A WEB-BASED HEALTH EQUIPMENT STORE SYSTEM USING REACT AND NODE.JS

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**Abstract:**
The rapid development of information technology has encouraged the utilization of web-based systems to improve data management efficiency and transaction processes across various sectors, including the healthcare sector. Manual management of medical equipment stores often leads to several problems, such as transaction delays, difficulties in managing product and inventory data, and limited access to information for customers. These conditions indicate the need for an information system that can support business processes more effectively and in a structured manner. This study aims to implement a web-based medical equipment store system that facilitates product management, sales transactions, and interactions between administrators and customers efficiently. The system development method used in this study is the Waterfall method, which consists of literature study, requirements analysis, system design, implementation, testing, and conclusion stages. The system is developed using a separated front-end and back-end architecture, where React is utilized to build an interactive and responsive user interface, Node.js is employed as the back-end to manage application logic and API services, and MySQL is used as the database management system. The results show that the developed system is able to meet both functional and non-functional requirements and effectively supports online product management and sales transactions. Based on the results of black box testing, all main system features function according to the specified requirements. Therefore, the proposed web-based medical equipment store system is expected to serve as an alternative solution to enhance efficiency in managing and delivering services for medical equipment stores.
**Keyword:** Information System; Medical Equipment Store; React.js; Node.js; Waterfall

## 1. Introduction

The increasing development of information technology has driven the use of systems in various sectors. The existence of an effective information system is crucial to support data management, transaction processes, and the rapid and accurate delivery of information. The healthcare sector, particularly in the management of medical device stores, also requires information technology support to improve service efficiency. Research (Hariz et al., 2022), found that the need for medical device information faces challenges in the form of lengthy transaction processes, requiring customers to search for medical devices at shopping centers or even outside the city where the product is available. The application of information technology is considered capable of facilitating online transactions for customers.

Several previous studies (Hariz et al., 2022) (Fatimah & Tabrani, 2018) have discussed the development of sales information systems in the healthcare sector. However, most of the developed systems still suffer from limitations in technology implementation and a clear separation between the front-end and back-end, and are generally developed as mobile-based applications. Furthermore, there is still little research specifically implementing a web-based medical device store system with an interactive interface and structured data management. This situation indicates a research gap that needs to be addressed through the development of a more optimal system tailored to user needs.

Based on these issues and research gaps, this study aims to implement a web-based medical device store system capable of expanding marketing reach, supporting transaction processes, and effective data management (Hibatullah et al., 2025). The system was developed using the Waterfall method, which includes requirements analysis, system design, implementation, and testing. The system was built by separating the frontend and backend, with React used to develop an interactive and responsive user

interface (Bismoputro et al., 2017), while Node.js served as the backend to manage application logic and API services that support effective communication and data exchange (Safitri, n.d.).

This research is expected to contribute to the development of a web-based medical device store information system by implementing a separate frontend and backend architecture using modern web technologies. This research's contribution lies in the implementation of React and Node.js to support efficient transaction processes, easy access to product information, and more structured data management. In addition, the results of this study are expected to be an alternative solution for managing medical equipment stores and become a reference for the development of similar systems in the future.

## 2. Research Method

The research method was used to ensure that the system development process was structured, systematic, and optimal. In this study, the Waterfall methodology was applied, a linear sequential SDLC model, or classic life cycle, where each stage must be completed before proceeding to the next (Ariyani et al., 2023). The stages used included literature review, requirements elicitation, design, implementation, testing, and drawing conclusions, as shown in Figure 1.

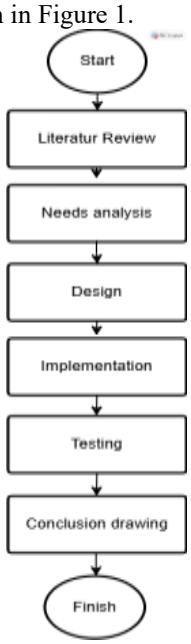


***Figure 1. Research Method***

### 2.1. Literature Review

The literature review was conducted by reviewing and selecting various theoretical references and sources relevant to the research. The purpose of this literature review was to identify and differentiate variables studied in previous research from those studied in this study. Reference sources were obtained from scientific journals, books, and reputable websites related to web-based information system development, MySQL database implementation, the use of React and Node.js technologies, the Software Development Life Cycle (SDLC) stages using the Waterfall method, and software testing methods using black box testing.

### 2.2. Needs Analysis

The needs analysis was conducted to obtain an overview of the system specifications required by users. This stage was conducted to identify the functional and non-functional requirements of the web-based medical equipment store system so that the developed system can operate according to user needs and research objectives.

### 2.3. System Design

System design is the next stage after the requirements analysis is completed. This stage aims to design an application based on the user needs identified in the previous stage. System design is conducted to provide a clear and structured overview of the system to be built, thereby minimizing errors during the implementation phase.

### 2.4. Implementation

The implementation phase is the system development process based on the design developed in the previous stage, referring to theories and references obtained from literature studies. At this stage, the entire system design is realized into a fully functional application that meets user needs. The web-based medical equipment store system was developed using an Object-Oriented Programming (OOP) approach

using React technology as the front-end, Node.js as the back-end, and a MySQL database as the data storage medium, resulting in a ready-to-use system that supports product management and sales transactions.

2.5. Testing

The testing phase is conducted to ensure that the developed system operates according to the established requirements and specifications. Testing aims to validate whether all system functions are running correctly and meeting functional and non-functional requirements. In this study, system testing was conducted using the black box testing method to verify system functionality based on the generated output without reviewing the code structure. If errors or discrepancies with the specified requirements are found during the testing phase, system improvements are made, followed by retesting until the system meets all expected functional and non-functional requirements.

2.6. Conclusion Drawing

Conclusions are drawn after all stages of system development have been completed. The resulting conclusions represent the analysis of the web-based medical device store system that has been designed, implemented, and tested. At this stage, a summary of the research results is presented, answering the problem formulation established in the introduction and demonstrating the achievement of the research objectives. Furthermore, the conclusion section also includes suggestions and recommendations for future system development and refinement to ensure optimal and sustainable operation.

## 3. Results and Discussion

The results and discussion section is presented systematically to outline the findings obtained from the system development and testing process and discuss the meaning of these results. In this section, the research results are explained in a structured manner and analyzed by linking them to the research objectives and system requirements previously formulated.

3.1. Needs Analysis

The results of the needs analysis indicate that a web-based medical device store system requires clear functional requirements modeling to illustrate the interactions between users and the system. This functional requirements modeling is represented in the form of a Use Case Diagram involving two main actors: the Admin and the Customer.

The Admin has functional requirements for logging into the system, managing customer data, managing categories and products, and conducting order transactions. These requirements aim to ensure that data management and transaction flows can run in a structured and controlled manner.

Meanwhile, the Customer has functional requirements for registering and logging in, browsing product categories, adding products to the cart, making payments, viewing account details, canceling orders before shipping, and providing feedback on the service. All of these customer activities rely on the authentication process, making the login function a primary requirement linked to the system's use cases.

In addition to functional requirements, the requirements analysis also includes non-functional requirements such as ease of use of the interface, user data security, and system reliability in handling transactions. Use Case Diagrams are used as a basis for understanding system requirements comprehensively and serve as a reference during the system design and implementation stages.

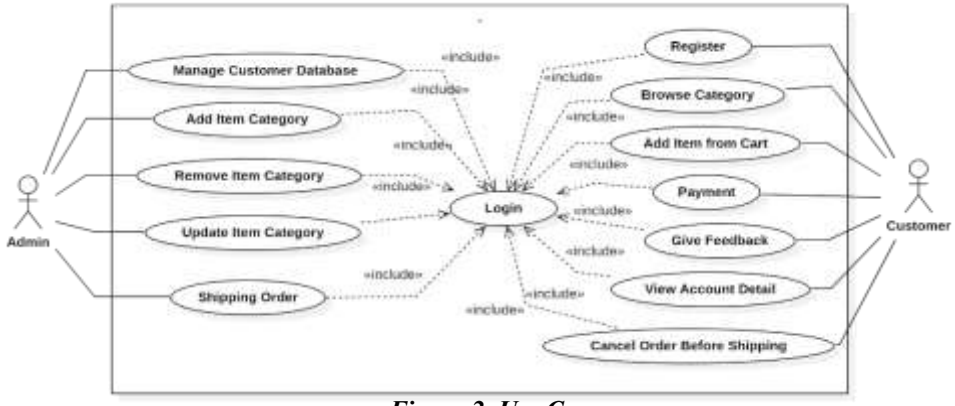


*Figure 2. Use Case*

3.2. Design

3.2.1 System Design

System design is carried out to illustrate the process flow and activities that occur in the web-based medical device store system. At this stage, the system modeling is represented using Activity

Diagrams, which serve to explain the sequence of activities and process flow carried out by users and the system in a structured manner, from authentication to transaction completion.

The Activity Diagram illustrates the flow of activities based on user roles, namely admin and customer. Admins manage category and product data, process orders, and arrange shipping, while customers browse products, add products to their cart, checkout and make payments, and provide feedback. This modeling provides a comprehensive overview of the system workflow and is used as a reference during the implementation and testing stages.

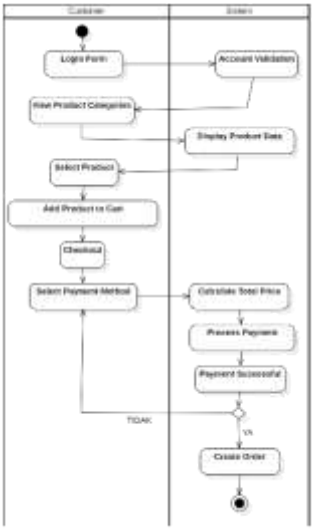


**Figure 3. Activity Diagram**

3.2.2 Interface Design

The interface design was carried out to illustrate the appearance and navigation flow of the web-based medical device store system. The system interface was designed to include login and registration pages, product catalog pages, shopping cart pages, transaction pages, and data management pages for the admin. This interface design aims to facilitate user access to system features and support effective transaction and data management processes.

3.3. Implementation

3.3.1 Database Implementation

The database implementation was carried out using MySQL as the data storage medium. The database structure was designed to store user, category, product, transaction, payment, and feedback data. Each table is connected through relationships designed during the system design stage, thus supporting integrated and consistent data management processes.

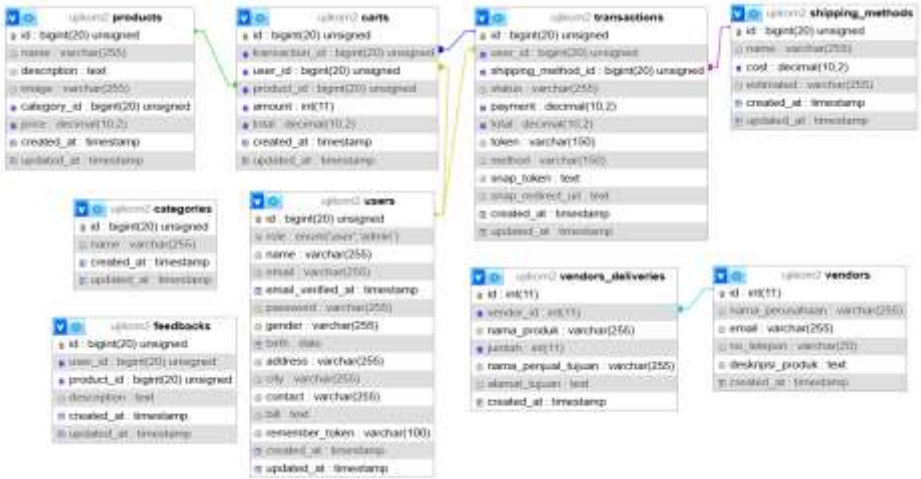


**Figure 4. Database Implementation**

3.3.2 Interface Implementation

The interface was implemented using React as the front-end to build an interactive and responsive system interface. Meanwhile, Node.js was used as the back-end to manage the application logic and provide API services that connect the interface to the database. This implementation resulted in a web-

based medical device store system capable of displaying product information, processing transactions, and managing data effectively.

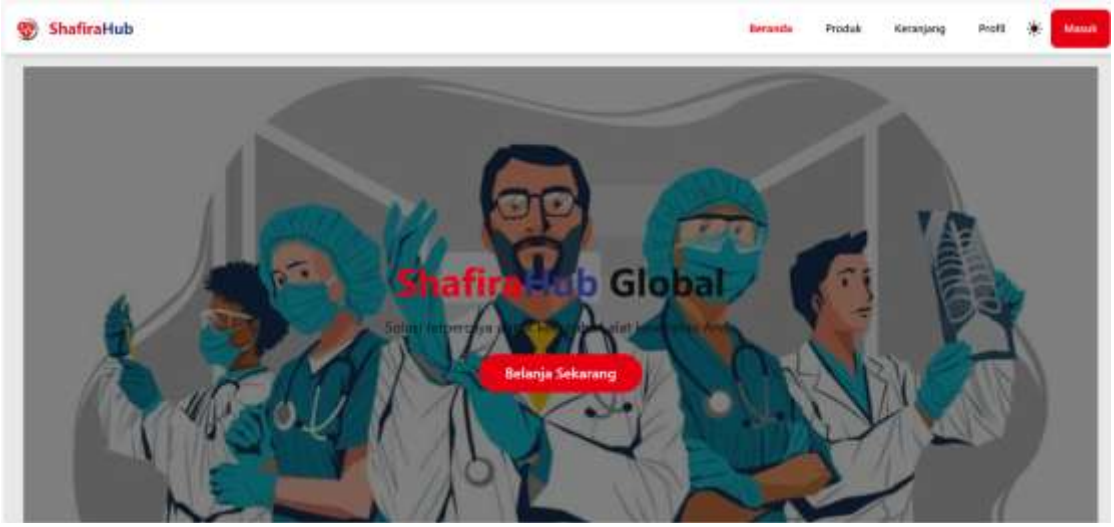


**Figure 5. Dashboard Customer**

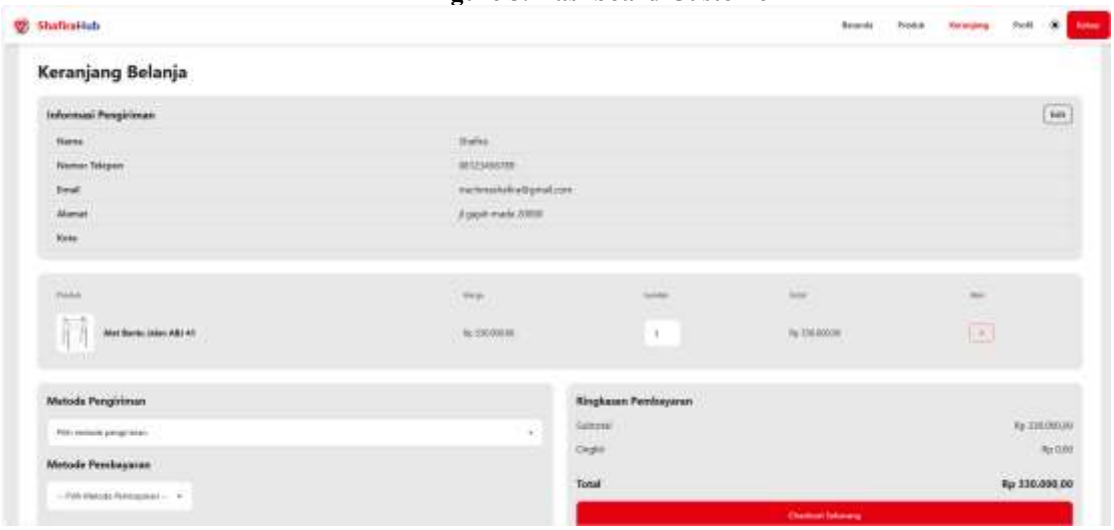


**Figure 6. Customer Cart**

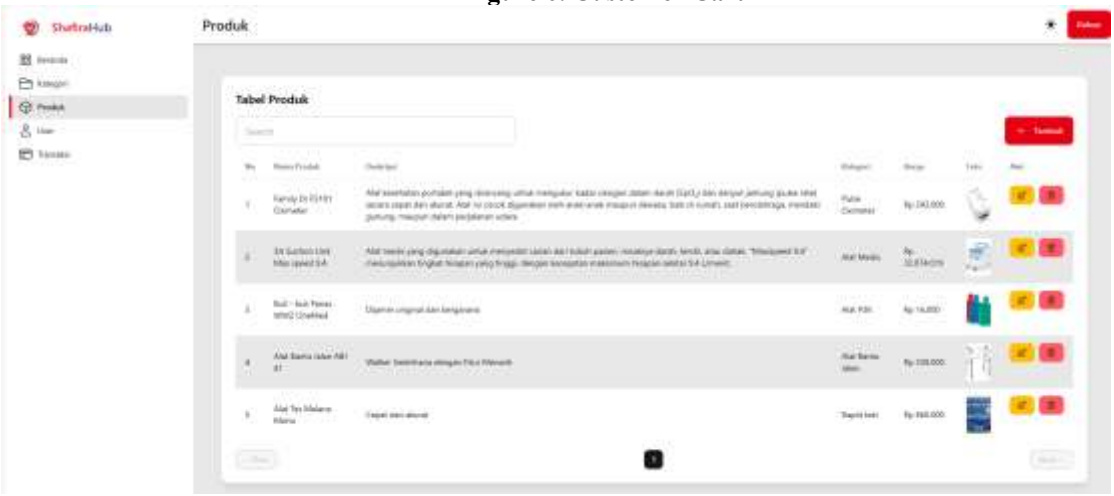


**Figure 7. Admin Product Management**

3.4. Testing

System testing results indicate that all key system features operate according to established requirements. Testing was conducted using black box testing to ensure system functions are running correctly based on the output generated.

**Table 1. Blackbox Testing Results**

| Scenario | Expected Results | Actual Results | Status |
|---|---|---|---|
| Completed registration form with complete data input according to requirements. | Successfully registered account. | Successfully registered. | PASSED |
| Completed login form with complete data input according to requirements. | Successfully logged in | Successfully logged in | PASSED |
| Viewed and selected product categories. | Successfully selected product categories. | Successfully selected product categories | PASSED |
| Selected products to add to shopping cart. | Successfully added products to cart. | Successfully added products to cart. | PASSED |
| Selected shipping method. | Successfully selected shipping method. | Successfully selected shipping method | PASSED |
| Selected payment method. | Successfully selected payment method. | Successfully selected payment method. | PASSED |
| Placed order/checkout. | Successfully placed order/checkout | Successfully placed order/checkout. | PASSED |

Each feature, such as login, product management, transactions, and payments, was tested to ensure there were no functional errors. Based on the test results, the system met functional requirements and was capable of optimally managing and processing transactions for a web-based medical device store.\.

3.5. Conclusions

Conclusions were drawn after all stages of the web-based medical device store system development were completed. The conclusions were drawn based on an analysis of the system design, implementation, and testing process conducted using the Waterfall method. The results showed that the developed system was capable of supporting structured product and transaction data management and meeting user functional needs. Furthermore, the resulting system successfully addressed the research questions identified in the initial research phase. As a follow-up, suggestions for system development for further research, such as feature enhancements and performance optimization, were provided to ensure optimal and sustainable use.

## 4. Conclusion

Based on the research results, it can be concluded that the development of a web-based medical equipment store system by separating the frontend and backend was successfully realized, in accordance with the research objectives. The system was developed using the Waterfall method, which includes the stages of requirements analysis, design, implementation, and testing, ensuring a structured and systematic development process.

The requirements analysis results indicate that the system is able to accommodate the functional and non-functional needs of users, both admin and customer. The implementation of React technology on the frontend and Node.js on the backend has proven to be effective in producing an interactive interface and supporting effective application logic management and data exchange. Furthermore, the use of a MySQL database allows for integrated and consistent management of product, transaction, and user data. Based on the results of black-box testing, all key system features, such as registration, login, product management, ordering, payment, and transaction management, performed as expected and were declared valid. Therefore, the developed system meets functional requirements and is able to support transaction processes and management of the medical equipment store more efficiently.

Overall, this research successfully addresses the issues raised in the preliminary phase and contributes to the development of a web-based medical equipment store information system with separate front-end and back-end architectures. For further development, it is recommended to add advanced features such as improving system security and optimizing performance to ensure more optimal and sustainable system use in the future.

**Bibliografi**

Ariyani, S. P., Kurniawan, Y., Pamulang, U., Puspitek, J., & Selatan, K. T. (2023). *Sistem Informasi Transaksi Alat-Alat Kesehatan Berbasis Web Pada PT . Cipta Multi Persada*. *1*(5), 1119–1139.

Bismoputro, I., Huda, F. Al, & Brata, A. H. (2017). *Pengembangan Single Page Application Berbasis Reactjs Untuk Usaha Percetakan Online ( Studi Kasus : Global Grafika )*. *1*(1), 1–10.

Fatimah, S., & Tabrani, A. (2018). *Perancangan Sistem Informasi Penjualan Alat Kesehatan Dan Kedokteran Berbasis Web Pada PT . SINAR*. *4*(1), 24–37.

Hariz, A. M., Sianturi, R. S., & Kharisma, A. P. (2022). *Pengembangan Sistem Toko Online Alat Kesehatan berbasis Mobile dengan menggunakan Framework Angular ( Studi Kasus : Yes Medika )*. *6*(10), 4904–4911.

Hibatullah, M. H., Hananto, A. L., Informasi, S. S., Buana, U., & Karawang, P. (2025). *Perancangan Website E-Commerce Menggunakan Metode Waterfall Pada*. *2*, 116–124.

Safitri, R. K. (n.d.). *Implementasi REST API untuk Komunikasi Antara ReactJS dan NodeJS ( Studi Kasus : Modul Manajemen User Solusi247 )*. 0–4.