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Web-Based System Inventory at PT Sapta Tunas Teknologi

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Abstract: An Information System is a complex framework comprising multiple components that interact harmoniously to gather, store, process, produce, and disseminate valuable information, thereby facilitating and enhancing the operational efficiency of a company's business processes. For technology-driven enterprises like PT Sapta Tunas Teknologi, the implementation of an efficient and integrated inventory information system serves as a pivotal asset. Currently, PT Sapta Tunas Teknologi faces challenges in asset management, including difficulties in stock monitoring, scheduling demonstrations, and maintaining the status of demo devices such as servers, storage units, and switches. The management of demo devices has been predominantly reliant on Google Spreadsheets distributed via the WhatsApp application. This research endeavors to design and deploy a web-based inventory information system, with the primary objective of augmenting the effectiveness of demo device management at PT Sapta Tunas Teknologi. The system's design adheres to the System Development Life Cycle (SDLC) Waterfall methodology, employing a blend of programming languages such as HTML, PHP, Javascript, and the Laravel Framework, while the user interface is enriched by the Bootstrap Framework. The underlying data management system is facilitated by a MySQL database, ensuring robust and efficient data handling.

Keywords: HTML; PHP; Laravel; MySQL; Inventory.

1. Introduction

PT Sapta Tunas Teknologi (STT) is an Information Technology company based in Indonesia, established in 2015 and headquartered in Jakarta. STT offers a wide range of Information Technology services, including system integration, infrastructure management, cybersecurity, and application development. Since its inception, PT Sapta Tunas Teknologi has been dedicated to delivering innovative and high-quality IT solutions to clients across Indonesia. The company has consistently improved its quality and capabilities through collaborations with leading global technology partners, such as Cisco, Microsoft, VMware, and Oracle.

As PT Sapta Tunas Teknologi continues to grow, it has become a prominent IT company in Indonesia, boasting a dedicated workforce of over 150 employees committed to providing the best IT solutions to clients nationwide. As a leading IT company, PT Sapta Tunas Teknologi is committed to delivering cutting-edge technology solutions, enhancing customer productivity, and continually innovating to meet the evolving needs of customers in this digital era. Currently, PT Sapta Tunas Teknologi faces challenges in efficiently managing the inventory of demo devices, including servers, switches, and storage units. The company encounters difficulties in monitoring stock, scheduling demonstrations, and managing the status of borrowed demo devices. The purpose of lending demo devices is to provide potential users with the opportunity to test the functionality of these devices before making purchase decisions. The management of demo devices has thus far relied solely on Google Spreadsheets distributed through WhatsApp, which presents potential for errors and difficulties in inventory reporting and analysis.

Considering this situation, the author proposes the thesis topic, Design of a Web-Based Inventory Information System at PT Sapta Tunas Teknologi. The design of this web-based inventory system will primarily focus on monitoring the availability of demo device stock and recording the borrowing and return of devices. The aim of this design is to assist the company in managing demo device inventory and optimizing the process of recording device loans and returns through

computerized automation [1]. The designed system is a web-based program, accessible through a web browser with an internet connection. The web application will incorporate multimedia elements, including text, images, audio, and video content [2].

2. Research Method

2.1. Waterfall Method:

The methodology adopted for the design of the web-based inventory information system at PT Sapta Tunas Teknologi is rooted in the System Development Life Cycle (SDLC) Waterfall model [3]. The Waterfall model, known for its simplicity, serves as the foundational framework for various other software development models. It has been chosen for its ease of comprehension and its minimal propensity for changes during the development process. This method facilitates the systematic structuring of the design process, where each phase seamlessly transitions into the next, earning it the moniker Waterfall model [4].

1) Analysis: The primary aim of the analysis phase is to meticulously discern the software requisites and user needs. These prerequisites are meticulously gathered through rigorous observations and insightful discussions. Subsequently, the collected data undergoes in-depth analysis, yielding an understanding of user exigencies and laying the foundation for the conceptualization and design of the website.
2) Design: The design phase assumes the role of crafting a comprehensive depiction of what must be created and how the system's interface shall take form. For the web-based inventory information system at PT Sapta Tunas Teknologi, this phase entails the creation of Use Case Diagrams, Use Case Scenarios, Activity Diagrams, Sequence Diagrams, Class Diagrams, Conceptual Design, Logical Design, and Physical Design.
3) Implementation: Post-design, the subsequent stride in the development of the web-based inventory information system at PT Sapta Tunas Teknologi involves the actualization of the programmed components.
4) Testing: The ensuing phase following program implementation for the inventory information system at PT Sapta Tunas Teknologi is the thorough scrutiny of program functionality. This pivotal stage is orchestrated to unearth any latent system irregularities.
5) Maintenance: The ultimate stage in the development cycle of the web-based inventory information system at PT Sapta Tunas Teknologi encompasses the maintenance and rectification of any latent program anomalies that may have evaded detection in prior phases.

2.2. Process Design

1) Use Case Diagram: Employed to represent the interplay between users and the system, use case diagrams are instrumental in conveying system functionality and interactions between actors and the system. Figure 1 provides a visual representation of the use case diagram in the context of the web-based inventory information system design at PT Sapta Tunas Teknologi.

Figure 1. Use Case Diagram

2) Class Diagram: A class diagram, serving as a blueprint of the system's structure, delineates classes, attributes, methods, and packages. It furnishes a panoramic overview of the application or website under development. Figure 2 illustrates the class diagram incorporated within the design of the web-based inventory information system at PT Sapta Tunas Teknologi.

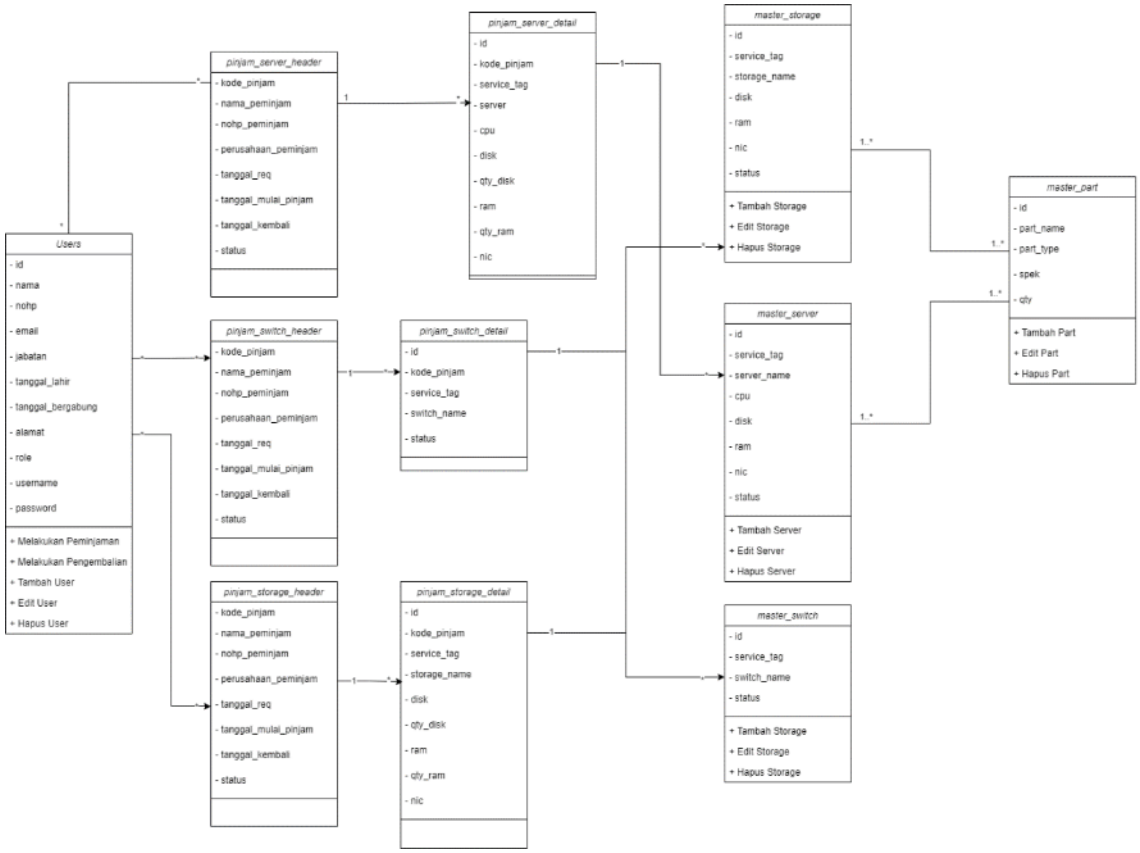


Figure 2. Class Diagram

3) Conceptual Design: The conceptual design is a visual instrument employed in data modeling, accentuating data structure and the interconnectedness of entities within a system or database. It augments the comprehension of data organization, storage, and interaction within the system. A comprehensive conceptual design, inclusive of entities, relationships, attributes, and cardinality, is depicted in Figure 3 within the framework of the web-based inventory information system design at PT Sapta Tunas Teknologi.

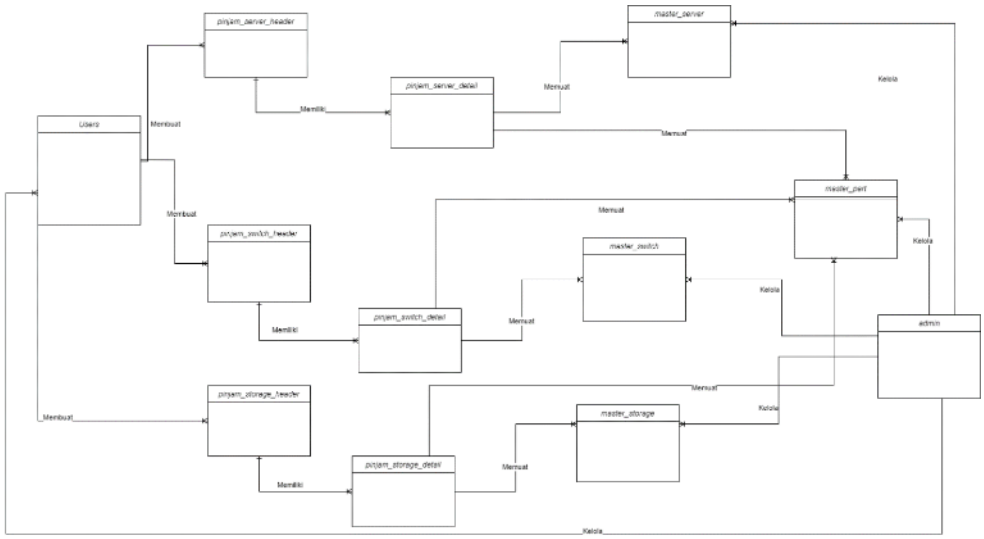


Figure 3. Conceptual Design

4) Logical Design: Logical design, a pivotal facet of database design, expounds upon how tables interact or relate within a database system. It empowers users to amalgamate data from diverse tables, culminating in a more comprehensive dataset, or to depict relationships among varied entities in the system. The logical design integrated into the web-based inventory information system design at PT Sapta Tunas Teknologi is elucidated in Figure 4.

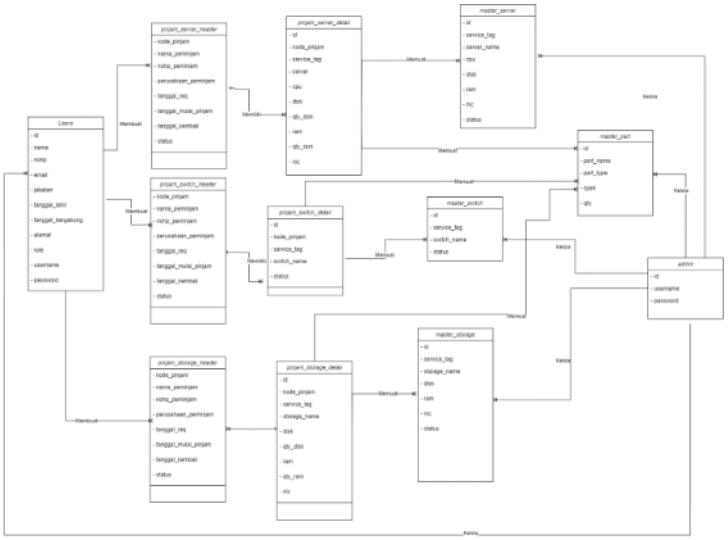


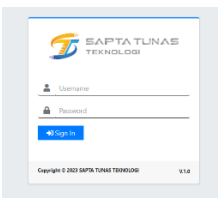
Figure 4. Logical Design

These meticulous methodologies and comprehensive steps are poised to ensure the design and development of the web-based inventory information system at PT Sapta Tunas Teknologi adhere to the highest professional standards, guaranteeing that the system effectively fulfills both corporate and user requirements.

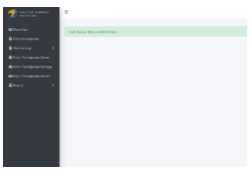
3. Result and Discussion

3.1 Results

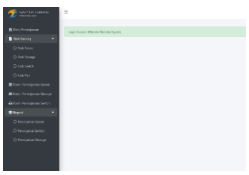
The following are the outcomes of the web-based inventory information system design at PT Sapta Tunas Teknologi; On the login page, users are required to fill in their username and password in the account registered by the administrator. The user login page's appearance can be observed in Figure 5.a. The admin dashboard page allows administrators to view the features that can be managed by administrators. The features that can be managed by administrators include viewing device stocks, creating device loan forms, specifying return dates for devices, viewing device loan data, examining the history of borrowed and returned devices, as well as adding, editing, and deleting officer accounts and device stocks. The admin dashboard page's appearance can be seen in Figure 5.b. The officer dashboard page enables officers to view the features that can be managed by them. Features that officers can manage include viewing device stocks, creating device loan forms, specifying return dates for devices, viewing device loan data, and examining the history of borrowed and returned devices. The officer dashboard page's appearance can be seen in Figure 5.c. On the user data page, administrators can add and edit officer data. The user data page's appearance can be seen in Figure 5.d. On the device loan data page, both administrators and officers can view the data on the devices that are currently on loan. The device loan data page's appearance can be seen in Figure 5.e. On the server stock page, administrators can view, edit, add, and delete available server stocks, while officers can only view available server stocks without the ability to edit, add, or delete them. The server stock page's appearance can be seen in Figure 5.f. On the storage stock page, administrators can view, edit, add, and delete available storage stocks, while officers can only view available storage stocks without the ability to edit, add, or delete them. The storage stock page's appearance can be seen in Figure 5.g. On the switch stock page, administrators can view, edit, add, and delete available switch stocks, while officers can only view available switch stocks without the ability to edit, add, or delete them. The switch stock page's appearance can be seen in Figure 5.h. On the server loan form page, both administrators and officers can record server loan transactions. Officers are required to input the borrower's name, borrower's phone number, borrower's company, start date of the loan, server's service tag, server name, CPU, disk, memory, and NIC. The server loan form page's appearance can be seen in Figure 5.i.



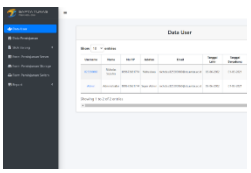
(a) User Login Page



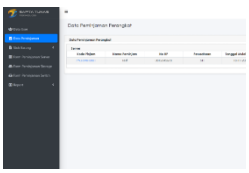
(b) Admin Dashboard Page



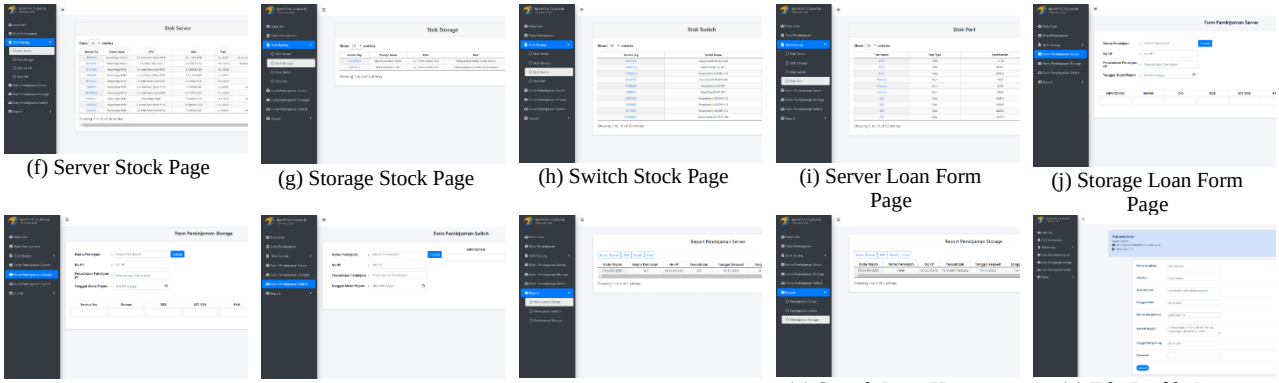
(c) Officer Dashboard Page



(d) User Data Page



(e) Device Loan Data Page



(f) Server Stock Page (g) Storage Stock Page (h) Switch Stock Page (i) Server Loan Form Page (j) Storage Loan Form Page

(k) Switch Loan Form Page (l) Server Loan History Page (m) Storage Loan History Page (n) Switch Loan History Page (o) Edit Profile Page

Figure 5. Web-Based Inventory Information Interface

On the storage loan form page, both administrators and officers can record storage loan transactions. Officers are required to input the borrower's name, borrower's phone number, borrower's company, start date of the loan, storage's service tag, storage name, disk, memory, and NIC. The storage loan form page's appearance can be seen in Figure 5.j. On the switch loan form page, both administrators and officers can record switch loan transactions. Officers are required to input the borrower's name, borrower's phone number, borrower's company, start date of the loan, switch's service tag, and switch name. The switch loan form page's appearance can be seen in Figure 5.k. On the server loan history page, both administrators and officers can view the history of server loans, including borrower data, server specifications, loan date, and return date. The server loan history page's appearance can be seen in Figure 5.l. On the storage loan history page, both administrators and officers can view the history of storage loans, including borrower data, storage specifications, loan date, and return date. The storage loan history page's appearance can be seen in Figure 5.m. On the switch loan history page, both administrators and officers can view the history of switch loans, including borrower data, switch specifications, loan date, and return date. The switch loan history page's appearance can be seen in Figure 5.n. On the edit profile page, both administrators and officers can edit their profiles. This page includes fields for full name, job title, email address, date of birth, phone number, address, and joining date. The edit profile page's appearance can be seen in Figure 5.o.

3.2. Discussion

The web-based inventory information system developed for PT Sapta Tunas Teknologi marks a substantial improvement in managing their demo device inventory. The system streamlines inventory management, offering a comprehensive view of device availability, which empowers efficient decision-making regarding device allocation and procurement. With user-specific dashboards for administrators and officers, the system enhances the user experience by tailoring functionalities to their roles. The loan processing has become more efficient, reducing paperwork and errors. The system's ability to maintain comprehensive historical records allows for valuable insights into device utilization and lifecycle tracking. Additionally, user profile management fosters efficient communication within the system. However, there is room for further improvement in areas such as reporting and analytics, system integration, and user training. Overall, the system represents an asset for PT Sapta Tunas Teknologi Technology-driven operations, poised to enhance efficiency and decision-making.

4. Related Work

In the domain of inventory management, several research endeavors have been undertaken to develop inventory information systems, often incorporating web-based technologies, and employing distinct methodologies. For instance, Ramayu (2023) embarked on a study that entailed the creation of a pharmacy inventory system, hinging on the System Development Life Cycle (SDLC) methodology [9]. The principal objective was to streamline data processing and heighten efficiency in the management of pharmaceutical inventory. Rahma and Abdussalaam (2023), on the other hand, placed their focus on the design of an accounting information system dedicated to raw materials and finished goods inventory management at PT. SMU. They opted for the Waterfall methodology, aspiring to craft a computerized system capable of facilitating precise and expeditious inventory control [11]. Kinaswara (2019) contributed to the academic discourse by developing a web-based inventory application tailored for Kelurahan Bantengan, employing the Waterfall method as the underlying methodology [12]. The application's core purpose was to simplify inventory management within the local administrative context. Pranoto and Sediyono (2021) delved into the intricacies of a web-based item inventory system implemented in a remote village within West Kalimantan. Their primary objective was to enhance the performance

of village officials in their endeavor to manage inventory data adeptly. To realize this vision, they harnessed an ensemble of programming languages, including HTML, CSS, JQuery, JSON, PHP, and MySQL [13].

Manday, Wijaya, and Waruwu (2023) set their sights on optimizing inventory management for business profitability through the development of an online web-based inventory system tailored for Prima Indonesia University. This endeavor saw them adopting the Waterfall model and conducting black box testing, ultimately leading to the conclusion that the system considerably improved inventory management efficiency [14]. Sirait, Gunaryati, and Rahman (2023), meanwhile, embarked on the creation of an inventory system for HKBP Taman Mini church. In pursuit of this goal, they chose to embrace the Rapid Application Development (RAD) methodology, resulting in the establishment of a web-based system that streamlined asset management processes and curtailed data processing errors [15]. Furthermore, Usnaini, Yasin, and Sianipar (2021) presented a comprehensive exposition on a web-based asset inventory system that took root in SDN Rawamangun 09, with the methodological scaffold of the Waterfall methodology [5]. Likewise, Oktaviani and Widiarta (2019) dedicated their efforts to the crafting of a web-based inventory system destined for SMP Negeri 1 Buer [6]. The system's primary aim was to facilitate inventory numbering, data compilation, and transaction tracking, an aspiration channeled through the prism of the Waterfall methodology. Sadharma (2021) enriched literature by devising an asset collection information system that draws its foundation from website-based functionalities [7]. The principal intent behind this creation was to amplify the precision and efficiency of targeted asset information retrieval, featuring an architectural underpinning that integrated HTML, CSS, JQuery, JSON, PHP, and MySQL programming languages. Lastly, Rafiqah, Wali, and Idwan (2023) contributed to the burgeoning field through the design and realization of a web-based vehicle asset information system for Islamic Shariah services domiciled in Banda Aceh City. In pursuit of this initiative, they harnessed the methodological approach of extreme programming. The resulting system efficiently administers vehicle asset data and streamlines the reporting process, affording a timely and expedient mechanism for stakeholders [8].

Collectively, these scholarly undertakings underscore a multifaceted panorama of methodologies and technological deployments within the ambit of inventory information systems. Importantly, they underscore the paramount importance of computerized systems in engendering efficiency and precision within the realm of inventory management [9][10][11][15]. This research is closely related to a series of previous studies that have been conducted in the inventory management domain. This research is based on existing findings and methodologies and contributes to further developments in efforts to optimize inventory management by utilizing web-based technology and certain methodologies. In developing a web-based inventory information system, this research utilizes various methodologies that have been tested and proven effective in previous research. In addition, this research also considers previous findings regarding the use of web-based technology to optimize inventory management. Through this research, additional contributions can be made to understanding and implementing more efficient and accurate inventory management practices.

5. Conclusion

In this research, we have successfully designed a web-based inventory information system using the System Development Life Cycle (SDLC) methodology and leveraging web-based technology. The system has been developed to address inventory management issues in various contexts, such as pharmacy, manufacturing, and local government. The results of this research demonstrate that the implementation of the SDLC method in the development of inventory information systems provides a structured and organized framework, which facilitates users in recording, monitoring, and managing inventory items. The system also allows administrators to create transaction records, inventory reports, and other items more efficiently. Furthermore, this web-based inventory information system can provide significant benefits in reducing inventory data inaccuracies, improving efficiency, and enhancing the quality of service to customers. With this system in place, users can easily access real-time data on stock items, income, and expenditure transactions, as well as inventory reports. In web-based application development, this research contributes additional insights into how web-based technology can be utilized to optimize inventory management. It is hoped that these findings can make a significant contribution to efforts aimed at improving the efficiency and accuracy of inventory management across various sectors and organizations. Additionally, this research provides a foundation for further development of web-based inventory information systems that can be adapted to various business needs and organizations in the future.

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