Journal of Artificial Intelligence and Engineering Applications

Website: https://ioinformatic.org/

15th October 2025. Vol. 5. No. 1; e-ISSN: 2808-4519

Design and Development of a Web-Based Inventory Information System at the Medan Marelan District Office

Michael[1*], Robet[2], Leony Hoki[3]

[1,2,3]Informatics Engineering, STMIK TIME Medan, Indonesia
michaeltujuh7@gmail.com[1], robertdetime@gmail.com[2], leony.hoki@gmail.com[3]*

Abstract

This research aims to design and implement a website-based Inventory information system at the Medan Marelan Sub-district Office to improve efficiency, accuracy, and transparency in asset management. The manual system that was previously used has proven to have various weaknesses, such as being prone to recording errors, duplication of data, and delays in reporting. To overcome these problems, the author developed a web-based information system using the PHP programming language, MySQL database, and Bootstrap framework. This system includes key features such as user login, information dashboard, goods monitoring, supplier management, incoming and outgoing goods transactions, and automatic report generation. The test results show that the system built can simplify the inventory administration process, speed up data search, and improve data reliability. With a user-friendly interface, this system is also well received by non-technical staff in the Medan Marelan Sub-district Office. Overall, this research contributes to the development of an effective government information system and supports digital transformation at the sub-district level.

***Keywords**:* Information System, Inventory, Website, Government.

1. Introduction

The administrative efficiency of the government sector has been supported by a significant acceleration in the development of information technology over the past ten years. Along with the increasing demand for the digitization of public administration services, the adoption rate of web-based systems in the public sector has grown by 38% over the past three years, according to a Kominfo report [1]. One of the main areas affected is asset inventory management, where it is determined that the current manual methods can no longer meet the requirements for accuracy, efficiency, and transparency. This situation makes the adoption of a website-based information inventory system a must, especially for public service organizations such as the Medan Marelan Sub-district Office.

The current management of asset inventory data by the Medan Marelan District Office still uses traditional techniques, such as manual recording using paper documents and basic spreadsheets. It is prone to delays in the asset reporting process, data loss, duplication, and recording errors. According to research by Sari et al. [2], government organizations that do not yet have a digital inventory system face an annual asset data mismatch rate of up to 27%. This problem has an impact on data-driven decision-making constraints and hinders transparency and accountability in the management of public resources. Website-based inventory information systems have been the subject of several previous studies, including those conducted by Putra and Wijaya [3], who created a system for managing products in educational institutions using PHP and MySQL.

Performance efficiency increased by 45%, according to the data. However, the educational environment is still the exclusive focus of this research, and no implementation research has been conducted in the sub-district government sector, which has special demands. The research of Lestari et al. [4] illustrates the importance of creating a government system that is simple enough for non-technical operators to use. This vision guides the research objectives to create a website-based information inventory system that improves asset recording at the Medan Marelan District Office in terms of speed and calculation, while taking into account the unique operational requirements and ease of use in the sub-district. It is expected that the development of customized systems will improve the literature on the implementation of inventory information systems in the local public service sector and address the current shortcomings of manual systems. Furthermore, this research will offer useful insights to encourage digital transformation in government offices at the sub-district level [5]. In order to improve the performance of the Medan Marelan District Office, the main purpose of this research is to develop and build an information inventory system that is easy to use, efficient, and effective. It is hoped that this research can theoretically improve our understanding of how web-based information systems are developed within the framework of local government. In practice, this approach will help improve the speed, accuracy, and transparency of asset management, ultimately driving the development of more responsible and professional

public services. [6]. Therefore, the author will make a study entitled "Inventory System Planning at the Medan Marelan Sub-district Office Based on Website".

2. Literature Review

2.1 Definition of Information Systems

Information systems and the actions of their users to support management and operations form an information system. An information system is defined by Praguna and Nugroho (2021) [7] as a system that is structured to collect daily transaction processing needs, support operations, collect organizational strategies and management activities, and provide necessary third-party reports. Organizations can handle data effectively and facilitate decision-making with the help of information systems. According to Nur Rachman Dzakiyullah (2022), an information system is a collection of components that are integrated with each other to collect, process, store, and distribute data into information that is useful for decision-making and control in an organization. In his research that discusses the application of information systems in unmanned vehicle networks, Dzakiyullah emphasized the importance of the role of information systems in managing sensor data and communication between vehicles to improve the effectiveness and reliability of the system. Thus, information systems include technologies and processes that ensure the availability of accurate and timely information to users [8].

2.2 Inventory Information System

Inventory Information System is a system used by companies to manage their inventory data. To streamline and speed up the data processing process and reduce errors, Effendi et al. (2023) [9] explain that inventory information systems assist businesses in managing sales and purchasing issues and creating reports. Thus, more precise and efficient inventory management can be realized through an inventory information system. An inventory information system is an application designed to help manage and record stock of goods more efficiently and accurately, thereby reducing errors due to manual recording. According to Jamaludin's (2022) research, the architectural design of the inventory management information system in Sukabumi Regency aims to support food security programs by utilizing integrated technology to increase speed and security in managing stock data. The system adopts information security principles such as the CIA Triad (Confidentiality, Integrity, Availability) and the AAA (Authentication, Authorization, Accounting) mechanism to ensure the data managed is secure and trustworthy. With the implementation of this system, the inventory management process can run more effectively, supporting more timely and accurate decision-making [10].

2.3 Website

as an Information System Platform Due to its wide spread and ease of use, websites are one of the platforms that are often used in the development of information systems. The use of websites in library information systems increases service efficiency and makes it easier for users to access information, according to Murjoko and Effiyaldi (2023) [13]. Thus, a website can improve user service and operational efficiency as an information system platform. According to research by Purnama and Mulya (2022), websites as an information system platform have an important role in facilitating the management of digital activities, especially in the context of webinar management. The web-based information system they designed is able to automate the process of scheduling, participant registration, and certificate issuance efficiently and accurately. With the use of this website platform, the implementation of activities becomes more structured and transparent, thereby increasing the effectiveness of management and user satisfaction in using the service [14].

2.4 XAMPP

XAMPP is an open-source software that provides Apache, MySQL, PHP, and Perl-based on-premises server packages that can run on a variety of operating systems. XAMPP makes it easy for developers to test the system locally before uploading it to an online server[15].

3. Page style

3.1 Problem Analysis

In the process of managing inventory data at the Medan Marelan Sub-district Office, a number of problems were found that had an impact on the efficiency and accuracy of goods management. The manual recording system causes data to be easily lost, difficult to trace, and prone to input errors. In addition, limitations in terms of reporting and data search also slow down work processes and decision-making. The absence of an integrated information system makes supervision of the entry and exit of goods not optimal. Therefore, it is necessary to design a website-based inventory information system that is able to overcome these problems by providing automatic recording features, *real-time* inventory tracking, and fast and accurate reporting.

3.2 Analysis of processes that run appropriately in the field

In this analysis, the inventory management process at the Medan Marelan Sub-district Office is still carried out manually using recording in books and Excel without the support of a web-based system. This makes searching for data difficult, error-prone, and time-consuming report creation.

The following is a *Flowchart* of the current process method system can be seen in Figure 1 below

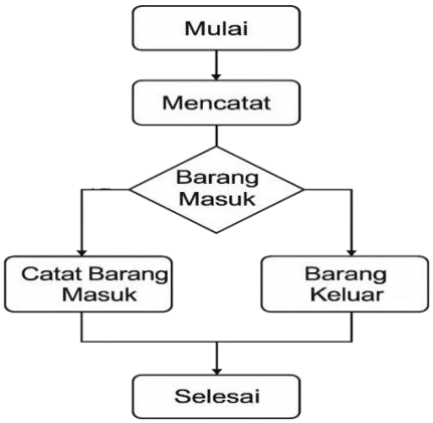

Figure 1: Inventory Management System Flowchart

In the *flowchart* above, it can be seen that the inventory management process is still carried out manually without the support of a web-based system. Recording of goods is carried out conventionally through books or Excel files by officers, which results in delays in recording and the potential for data errors. In addition, the process of monitoring the stock of goods cannot be carried out in *real-time*, so officers must check the data directly to find out the availability of goods. This makes the decision-making process less efficient, as well as making it difficult to compile reports and track the entry and exit of goods. With this condition, a website-based *Inventory information system* is needed that is able to provide accurate stock information on goods, quickly, and can be accessed at any time.

3.3 Developed Methods

Based on the above explanation, the researcher designed a system that makes it easier for officers to monitor inventory data in *real-time*. System

which is designed using web-based technology that is integrated with *the database*, allowing the recording and tracking of incoming and outgoing goods to be carried out automatically and accurately. The process of managing goods is carried out through a web-based interface that can be accessed by users flexibly through computer devices or smartphones. This system also provides reporting, data search, and stock management features, all of which aim to increase efficiency and transparency in inventory management at the Medan Marelan Sub-district Office.

4. Result and Discussion

Research results are a form of output or output of the research process that has been carried out based on the formulation of problems, objectives, and methods that have been predetermined. In the context of this research, the results of the research refer to the real implementation of a website-based Inventory information system that has been designed and built to be used at the Medan Marelan Sub-district Office.

1. Login Page:

The *login* page is the initial component of the information system that serves as an entry gate for users to access all the features and data available in the system. On this page, users are asked to enter the username and password that has been registered in the *system database*. This authentication process aims to ensure that only users who have legitimate access rights can use the system according to their role or level of access, such as administrators or general staff.

The appearance of the system interface when it has been run can be seen in the following Figure 2:

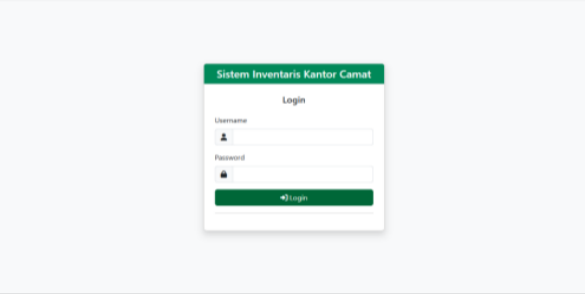

Figure 2: Login Page

2. Dashboard Page

On the *Dashboard* page is the main view that appears after the user successfully enters the system. *Dashboards* serve as a hub that provides real-time summary of important data and activities *in easy-to-understand visuals, such as graphs, numbers, tables, and notifications.*

The Dashboard page view can be seen in Figure 3 below:

Figure 3: Dashboard Page

3. Inventory pages per unit

An inventory page is a part of the system used to observe, review, and monitor the overall and up-to-date state of inventory data. The main function of this page is to present a list of all the items recorded in the system, complete with important information such as item codes, item names, categories, stock quantities, and storage locations.

In the Inventory information system at the Medan Marelan Sub-district Office, the display of the monitoring page can be seen in Figure 4 below.

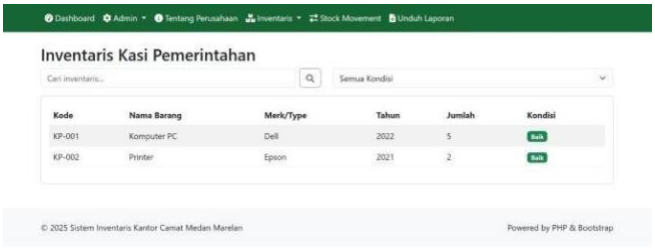

Figure 4: Monitoring Page

4. Account management page

The account management page functions to manage user data in the system, such as adding new accounts, viewing user lists, editing account information (name, password, access rights), deleting unused accounts, and setting user access levels (admin or regular users). In addition, this page also provides a password reset feature and can display user activity history for system audit purposes.

The view of the account management page can be seen in the following Figure 5 :

Figure 5. Account Management Page

5. Inventory Transaction Page

The Inventory Transaction page is an important part of the information system used to record and manage all the activities of entering and exiting goods from a warehouse or storage place. This page includes two main types of transactions, namely incoming goods and outbound goods, each of which has a structured data input form.

This simplifies the process of auditing and tracking goods. The view of the Inventory transaction page can be seen in Figure 6 below.

Figure 6: Monitoring Page

6. Account management page

The account management page functions to manage user data in the system, such as adding new accounts, viewing user lists, editing account information (name, password, access rights), deleting unused accounts, and setting user access levels (admin or regular users). In addition, this page also provides a password reset feature and can display user activity history for system audit purposes.

The view of the account management page can be seen in the following Figure 7 :

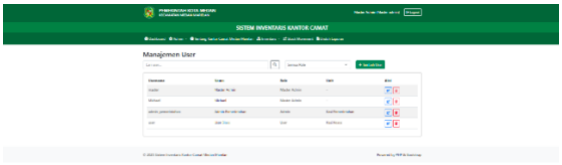

Figure 7: Account Management Page

7. Inventory Transaction Page

The Inventory Transaction page is an important part of the information system used to record and manage all the activities of entering and exiting goods from a warehouse or storage place. This page includes two main types of transactions, namely incoming goods and outbound goods, each of which has a structured data input form.

This simplifies the process of auditing and tracking goods. The view of the Inventory transaction page can be seen in Figure 8 below.

Figure 8: Inventory Transaction Page

8. Report Page

The report page is a feature in the information system that functions to present data from *Inventory management* in the form of a structured and easy-to-read document. The report produced can be in the form of data on incoming goods, outgoing goods, and the condition of goods stock in a certain period according to user needs.

With the report page, the reporting process becomes faster, more accurate, and more efficient, and helps increase transparency in managing inventory data. The view of the report page can be seen in the following Figure 9 :

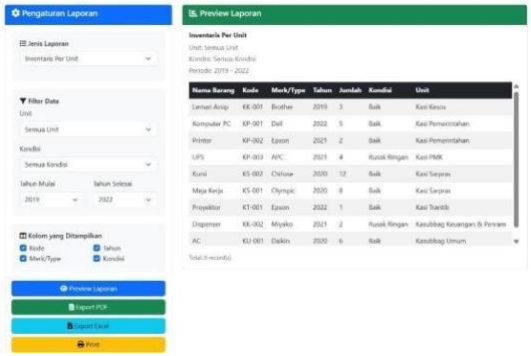

Figure 9: Inventory Transaction Page

5. Conclusions and Suggestions

5.1 Conclusion

Based on the above research, the researcher concluded that:

1. The website-based Inventory *information system* developed has succeeded in improving the efficiency and accuracy of inventory data management at the Medan Marelan Sub-district Office, replacing ineffective and error-prone manual methods.
2. Features such as item recording, stock monitoring, outbound/inbound transactions, and automated reports have helped speed up work processes, make it easier to track assets, and support more informed decision-making.
3. The level of user acceptance of the system is quite good, as the system is designed with a simple, easy-to-use, and accessible interface through a variety of devices, making it suitable for non-technical users in government environments.

5.2 Suggestion

The suggestions given by the researcher to researchers who want to develop this research can be seen below:

1. Improve System Security and Reliability
   It is recommended to add data encryption, two-factor authentication, and an automatic backup system to protect data from corruption or unauthorized access.
2. Integrate with Related Systems
   The system should be further developed to connect with the regional procurement and finance systems, thereby creating a more integrated and efficient workflow.

References

[1] Kominfo. (2022). *Laporan Tahunan Transformasi Digital Nasional 2022*. Kementerian Komunikasi dan Informatika RI.

[2] Sari, D., Pratama, R., & Rahman, A. (2023). *Evaluasi Sistem Inventarisasi Aset pada Instansi Pemerintah*. Jurnal Administrasi Publik, 12(1), 45-56.

[3] Putra A., & Wijaya, T. (2023). *Pengembangan Sistem Informasi Inventory Berbasis Website pada Lembaga Pendidikan*. Jurnal Sistem Informasi, 11(2), 112-120.

[4] Lestari M., Yusuf, M., & Handayani, D. (2022). *Perancangan Sistem Informasi Manajemen Aset dengan Fitur Audit Trail*. Jurnal Teknologi Informasi dan Komputer, 10(4), 325-334.

[5] Arifin, M., & Saputra, R. (2024). *Implementasi Sistem Informasi Berbasis Web di Instansi Pemerintahan: Studi Kasus Kecamatan X*. Jurnal Ilmiah Teknologi Informasi, 8(1), 55-66.

[6] Nasution F., & Ramadhani, D. (2023). *Transformasi Digital pada Pelayanan*

[7] Praguna, & Nugroho, A. (2021). "Pengertian Sistem Informasi." Jurnal Comasie, Universitas Putera Batam.

[8] N. R. Dzakiyullah, "Tunable Error Reduction Scheme in Proximity Sensor Function Applied to Unmanned Vehicular Networks," IEEE Sensors Journal, 2022.

[9] Effendi, E., Sagalai, R. S. A., & Rezeki, S. (2023). "Jenis-Jenis Sistem Informasi dan Model Sistem Informasi." Jurnal Pendidikan dan Konseling (JPDK), 5(2), 4944–4952.

[10] Jamaludin. (2022). Perancangan arsitektur sistem informasi inventory management system dalam mendukung smart economy Kabupaten Sukabumi. Jurnal Teknologi Sistem Informasi dan Aplikasi (JTSI), 7(3), 123- 134

[11] Murjoko, M., & Effiyaldi, E. (2023). "Analisis Efektifitas Sistem Informasi Perpustakaan UIN Sulthan Thaha Saifuddin Menggunakan Metode TAM." Jurnal Manajemen Sistem Informasi, 8(2), 322–336.

[12] Purnama, G., & Mulya, I. (2022). Perancangan Sistem Informasi Pengelolaan Webinar Berbasis Web. Arcitech: Journal of Computer Science and Artificial Intelligence, 2(2), 45-53.