DIJEFA: Dinasti International Journal of Economics, Finance & Accounting
E-ISSN: 2721-303X
P-ISSN: 2721-3021
https://dinastipub.org/DIJEFA dinasti.info@gmail.com +62 811 7404 455
DINASTI PUBLISHER

DOI: https://doi.org/10.38035/dijefa.v6i6

The Role of Merchandise Inventory Management Applications in Strengthening Internal Control Systems of MSMEs: A Case Study

Inanda Shinta Anugrahani[1], Fitri Purnamasari[2*], Muhammad[3], Safira Rusyda Azizah[4], Zainah Asmira[5], Novia Ramadhina Darmawan[6]
[1]Universitas Negeri Malang, Jawa Timur, Indonesia, inanda.shinta.fe@um.ac.id
[2]Universitas Negeri Malang, Jawa Timur, Indonesia, fitri.purnamasari.fe@um.ac.id
[3]Universitas Negeri Malang, Jawa Timur, Indonesia, muhammad.fe@um.ac.id
[4]Universitas Negeri Malang, Jawa Timur, Indonesia, safira.rusyda.fv@um.ac.id
[5]Universitas Negeri Malang, Jawa Timur, Indonesia, zainah.asmira.2309226@students.um.ac.id
[6]Universitas Negeri Malang, Jawa Timur, Indonesia, novia.rahmadhina.2309226@students.um.ac.id

[*]Corresponding Author: fitri.purnamasari.fe@um.ac.id[2]

Abstract: Most MSMEs in Indonesia still experience challenges in inventory management, primarily due to manual recording that can potentially lead to data errors and operational inefficiencies. Similar problems are experienced by Toserba HM in Malang Regency, which faces discrepancies between physical stock and system records, as well as difficulties in controlling receivables due to inaccurate recording. The limited utilization of the existing cashier system exacerbates these conditions, necessitating a simple and easy-to-use technology-based solution. This study aims to develop and test the effectiveness of a web application called SIP (Inventory Information System) to improve stock recording accuracy and operational efficiency at Toserba HM. This application is designed with a barcode feature to support real-time inventory recording and monitoring. The results are expected to demonstrate increased inventory management effectiveness and contribute to the application of information technology in strengthening the internal control system of MSMEs in the trade sector.

Keywords: Inventory management, web-based information systems, MSMEs.

INTRODUCTION

Most MSMEs in Indonesia still face challenges in managing inventory effectively. Businesses that still record stock manually often experience problems such as data errors, lost goods, or discrepancies between records and physical condition (Haryanto & Prawira, 2025; Handoko et al., 2024). These weaknesses can hamper cash flow and reduce operational efficiency because it is difficult for owners to accurately monitor inventory levels. According to Stevenson (2020), optimal inventory management allows companies to maintain a balance

between storage costs and operational needs to ensure a stable stock availability. Conversely, uncontrolled inventory can lead to excess or shortages of stock, which can result in financial losses and customer trust.

Limited resources, whether in terms of finance, storage space, or technology, require MSMEs to better manage inventory to ensure business survival and competitiveness. Research by Pangaribuan et al. (2023) shows that technology-enabled inventory management, such as web-based applications, can help businesses reduce operational costs by up to 15% and improve stock recording accuracy by up to 30%. This study emphasizes the importance of technology integration to address inventory management challenges in small businesses. Furthermore, research by Harlan et al. (2023) reveals that web-based inventory management applications that can be customized to the needs of business owners can help MSMEs monitor inventory more efficiently. Furthermore, Pratomo (2024) developed a web-based inventory management system that allows business owners to optimize procurement and sales processes by viewing inventory in *real time*.

One MSME facing similar challenges is Toserba HM, a grocery store located near a religious school in Malang Regency. The business's proximity to the school means that many of its customers are students and even local residents, who frequently transact on credit, or "ngebon." This situation creates problems because many receivables are uncollectible, while the owner only remembers the receivables exist without knowing the exact amount. As a result, business *turnover* has decreased and cash flow has become unstable. These problems indicate weaknesses in recording sales transactions and controlling receivables, which impact financial management performance.

In an effort to improve inventory management, Toserba HM previously used a cashier system with a stock recording feature. However, the system was not optimally utilized due to its complexity and limited equipment, resulting in ineffective recording. As a result, inventory control was not optimal, and discrepancies between physical stock and system records were often found. Based on these conditions, it was necessary to develop a new, simpler and more efficient system. A web-based application called SIP (Inventory Information System) was designed as a solution to help Toserba HM improve the effectiveness of internal control and the accuracy of stock recording using the *barcode feature*.

Based on the background description, it can be formulated that the main problem in this study is related to the effectiveness of merchandise inventory management at Toserba HM. This business still faces obstacles in maintaining accurate stock recording and operational efficiency, mainly due to limitations in utilizing the previously used cashier system. Therefore, this study focuses on the development and implementation of a SIP web application as a solution that is expected to increase the effectiveness of merchandise inventory management as well as improve the accuracy of stock recording and operational efficiency at Toserba HM.

The purpose of this study is to develop and test the effectiveness of a SIP web application in supporting the inventory management process at Toserba HM. Furthermore, this study also aims to evaluate changes in inventory management performance before and after the application's use. The results are expected to contribute to technological improvements in the effectiveness of inventory control systems in the trading sector of MSMEs.

Micro, Small and Medium Enterprises (MSMEs)

In Indonesia, various types of business activities play a vital role in the national economy. One such business is micro, small, and medium enterprises (MSMEs), which contribute significantly to income equality and employment. MSMEs create significant employment

opportunities, thus absorbing a wide range of labor. Furthermore, MSMEs also play a role in increasing community income, particularly in the micro-economy. The importance of MSMEs is evident in their ability to help address social and economic issues, such as poverty alleviation. With the existence of MSMEs, the unemployment rate can be effectively reduced. Moussa (2017) stated that MSMEs support the local economy and increase social stability by reducing poverty and unemployment. This demonstrates that MSMEs can be a crucial pillar for national economic growth.

Based on Law No. 20 of 2008 concerning MSMEs, the definition of MSMEs includes 3 categories, namely; Micro businesses are productive businesses owned by individuals or business entities that meet the criteria as micro businesses as regulated by law. Furthermore, small businesses are independent productive economic businesses owned by individuals or business entities that are not subsidiaries or branches of companies controlled or become part of either directly or indirectly of medium-sized businesses or large businesses that meet the criteria of small businesses as regulated by law. While medium-sized businesses are independent productive economic businesses owned by individuals or business entities that are not subsidiaries or branches of companies controlled or become part of either directly or indirectly of small businesses or large businesses with the amount of net assets or annual sales results as regulated by law.

Merchandise Inventory Management

Merchandise inventory is a critical current asset in the operational activities of a trading entity. Warren, Reeve, and Duchac (2021) define merchandise inventory as goods held by a company for resale to customers as part of its core business activities. Proper inventory management enables companies to maintain a balance between storage costs and inventory availability, preventing disruptions to sales activities (Stevenson, 2020). This demonstrates that inventory management is a crucial factor affecting a company's revenue and profits.

Inventory control is a process carried out to ensure that the quantity and value of inventory always meet a company's operational needs. Weygandt, Kimmel, and Kieso (2020) state that inventory control includes activities such as recording, reporting, and monitoring the quantity of merchandise. An inefficient inventory management system can cause problems, such as discrepancies between recorded and physical inventory, overstock , or stockouts. These problems result in decreased profits and loss of customer trust (Yang, Chen, & Zhao, 2018). Therefore, companies need effective inventory control to ensure data reliability and support informed decision-making.

Common inventory control methods are perpetual and periodic systems. Perpetual systems record all inventory transactions in *real time*, ensuring up-to-date inventory data. According to Horngren, Sundem, and Stratton (2020), this method is suitable for entities requiring accurate inventory management due to their high transaction volume. Inventory management also requires strong internal controls to protect company assets from misuse or theft.

Internal control encompasses policies and procedures to safeguard these assets. Porter and Norton (2018) emphasize that sound internal control helps ensure the accuracy of financial reporting and supports better managerial decisions. Therefore, inventory management controls are a critical component for improving operational efficiency and profitability, while also providing accurate data for decision-making.

METHOD

This research focuses on MSMEs in the trading sector experiencing challenges in accurately recording and monitoring inventory. The case study method was used because it helps researchers understand the real-world conditions faced by business actors. According to Yin (2018), case studies are effective for exploring complex problems in depth, while Stake (1995) states that this approach is appropriate for assessing the impact of an intervention in a real-world setting.

This study will examine the inventory management process before and after the use of a web application. Data were collected through interviews, direct observation, and document review related to operational activities and stock recording. System effectiveness will be measured based on inventory recording accuracy, data processing time efficiency, operational cost savings, and increased business revenue. The results of this study are expected to provide insight into how technology helps MSMEs improve their inventory management. Furthermore, this study is also expected to add to the reference literature on the application of information technology in the small business sector (Creswell, 2014; Sugiyono, 2019).

This study uses the *Waterfall Model approach* in the application development process. This model was chosen because it has a structured work process and is easy to apply to small-scale projects such as MSMEs. The *Waterfall stages* include requirements analysis, system design, coding, testing, and implementation (Adenowo, 2013; Pfleeger & Atlee, 2009). This approach is expected to produce applications that meet the needs of business owners and help manage inventory more effectively. In general, *the Waterfall model* has the following framework.

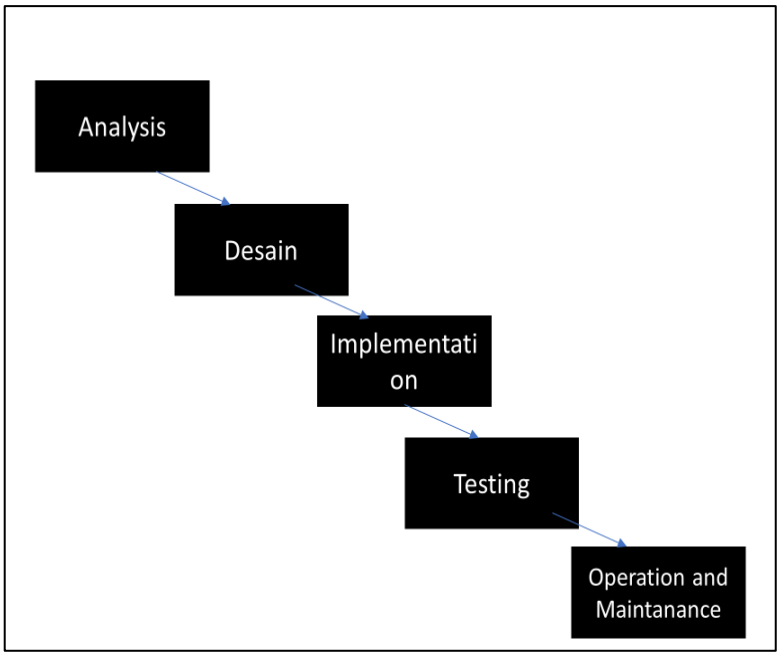

Figure 1. Waterfall model framework (Pfleeger SL & Atlee, J. M, 2009)

In the analysis phase, we conducted interviews and observations regarding the inventory management needs of research informants. Next, based on these results, we analyzed the existing problems. After conducting the problem analysis, we attempted to design financial management policies and applications, as well as designs for inventory management. Next, we implemented the policy and financial reporting application designs. At this stage, we presented

and implemented the policy and application designs. After completing this phase, we evaluated the designs to determine whether any implementation was difficult.

RESULTS AND DISCUSSION

HM Department Store is a small-scale retail business run by a husband and wife in Malang Regency. This business serves the daily needs of the local community, including students from a nearby Islamic boarding school. Although it has been operating for several years, the business is still managed in a rudimentary manner because the two owners lack basic accounting or inventory management skills. All transactions and inventory records are recorded manually using notebooks, which often results in discrepancies between recorded inventory levels and the physical store. This discrepancy often leads to confusion in determining the actual stock levels available, resulting in procurement difficulties and potential losses due to overstocking or understocking.

Furthermore, the disorganized recording process makes it difficult for owners to track items that are quickly out of stock or rarely sold. This situation also makes it difficult to calculate profits accurately because there is no clear recapitulation of sales and purchase costs. The owner has tried several times to match manual records with the conditions on the store shelves, but the results always show significant discrepancies. This situation slows down the customer service process because the owner often has to check the availability of goods directly on the shelves. Furthermore, some customers, including Islamic boarding school students (santri) or local residents, often incur debts with promises to pay by a certain time, but many delay payments past the promised deadline. This situation makes it difficult for the owner to collect receivables and does not know the exact amount of outstanding customer debt. As a result, the store's cash flow becomes unstable and turnover tends to decline over time. Therefore, a more practical and accurate system is needed so that the inventory management and receivables recording process at HM Department Store can run more efficiently and controllably.

The Inventory Information System (SIP) web application is a website developed to simplify the inventory management process at HM Department Stores. The application is designed to be easily accessible and usable by anyone, including business owners unfamiliar with technology. The primary goal of developing this application is to help business owners manage inventory more efficiently and accurately. The system development process is carried out in stages, starting with analyzing business owners' needs, designing the application's interface, and implementing it directly with business owners. After the system is implemented, an evaluation phase is conducted to ensure all available features are appropriate and support HM Department Store's operational needs.

The SIP web application provides several key features that enhance efficient inventory management. When a business owner first opens *the website* , the system displays a *login page.* The system prompts the business owner to enter *a username* and *password* to ensure only authorized users can access inventory data. This feature ensures data security by authenticating the business owner before logging into the application.

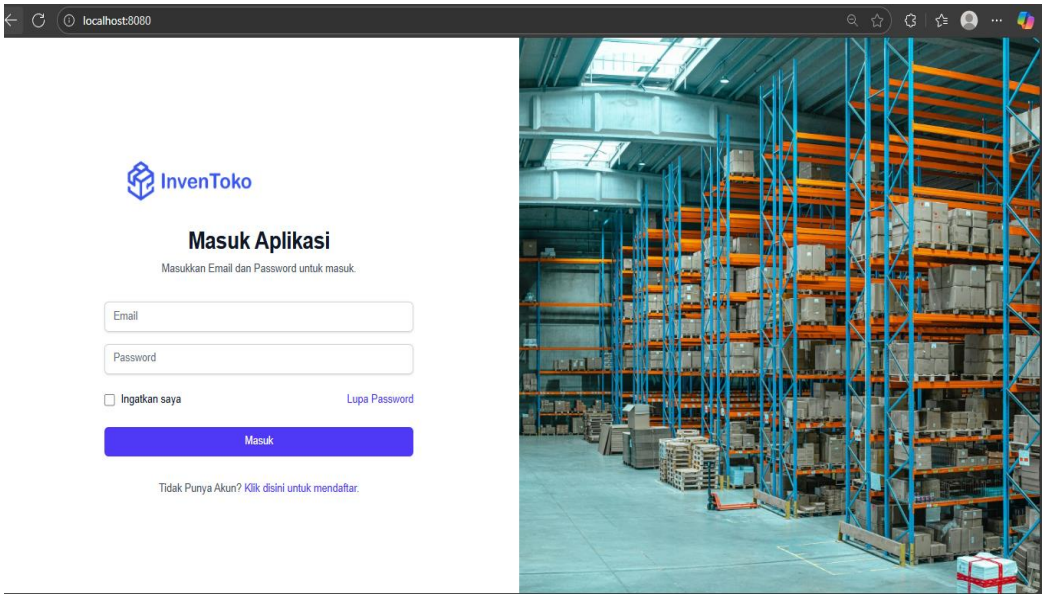

Figure 2. SIP Login Page

After successfully *logging in* , the application will direct business owners to the main *dashboard.* The dashboard displays a summary of important information, such as the total number of items, incoming and outgoing stock records, products that are about to expire or have expired, and the daily transaction value. Additionally, a graph of incoming and outgoing goods is provided to make it easier for business owners to monitor their inventory. *The dashboard's layout* is kept simple to ensure it's easy to understand for business owners unfamiliar with technology.

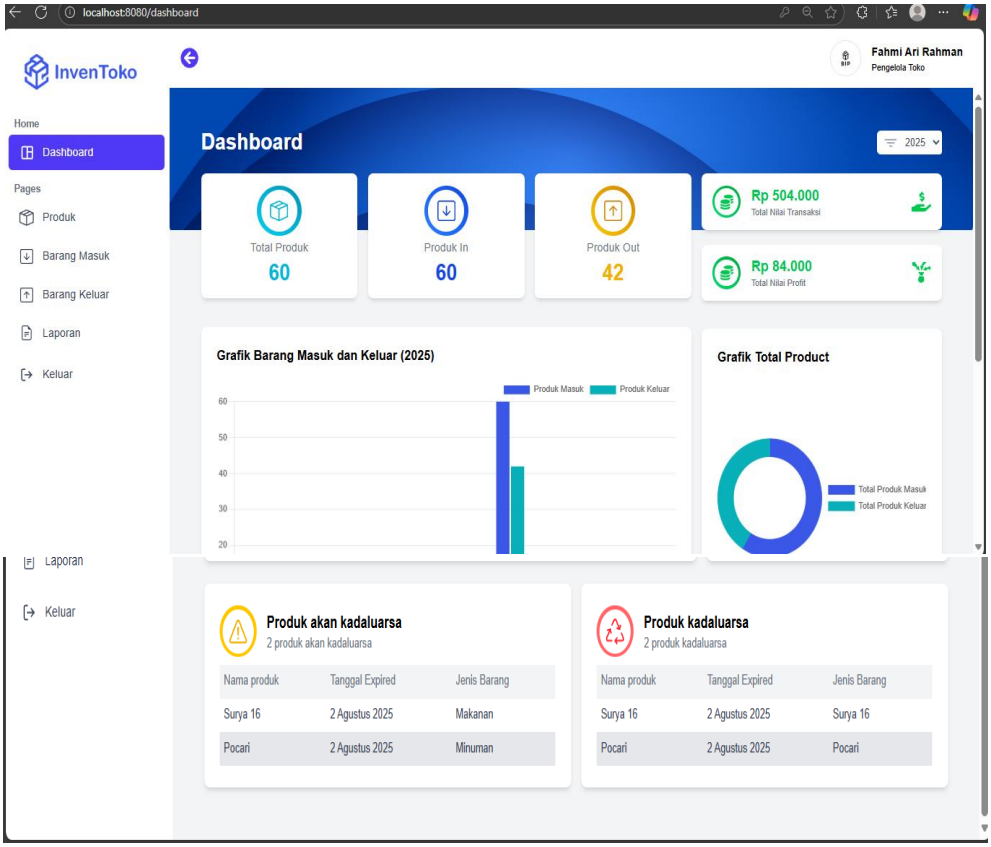

Figure 3. SIP Main Dashboard

The SIP application has four main interconnected menus: Products, Incoming Goods, Outgoing Goods, and Reports. Through the Products menu, business owners can manage merchandise data. This menu stores detailed information such as product ID, item code, name, type, unit, purchase price, selling price, profit, and stock quantity so that business owners can monitor item availability in *real-time.* Furthermore, the Incoming Goods and Outgoing Goods menus function to record stock addition and reduction transactions. These two menus have a main advantage, namely *barcode scanner integration.* This feature speeds up the recording process because business owners can scan item codes directly, minimizing the risk of input errors. This *barcode feature integration* helps Toserba HM maintain the conformity of physical stock with system data, while speeding up daily transactions.

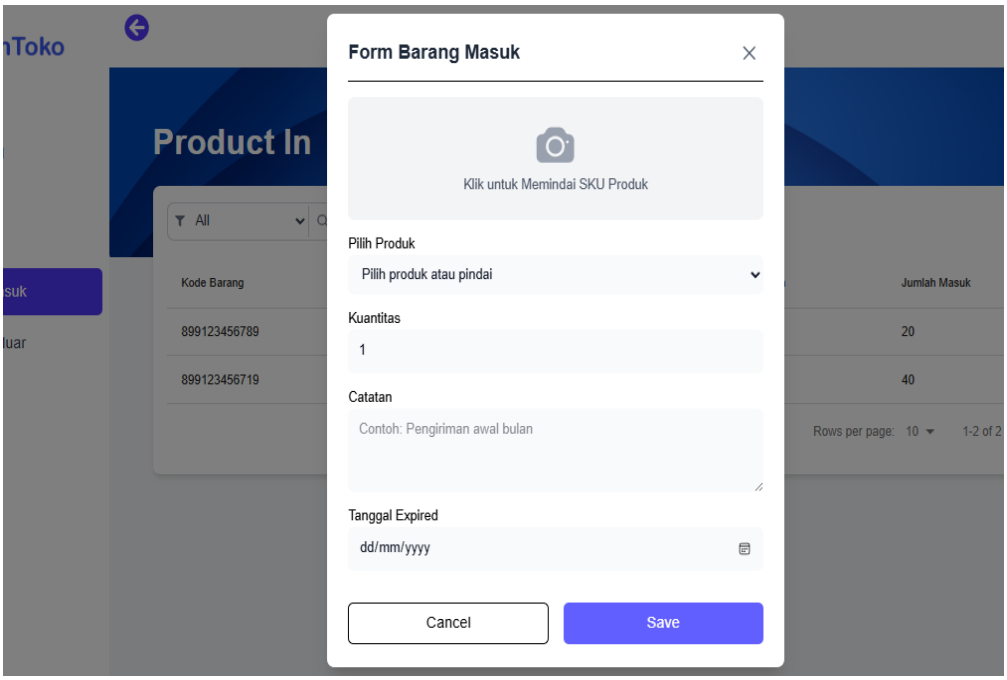

Figure 4. Barcode Scanner feature on the Incoming Goods Menu

The application also provides a stock report menu, which displays a summary of transactions and inventory data for a specific period. This feature allows business owners to view or download reports in PDF or *Excel format* , useful for analysis and decision-making. The Report menu also has a date filter function, making it easier for business owners to track stock changes in detail. Automatic recording and digital reporting in the SIP application make operational processes more efficient and strengthen internal control systems through accurate and documented data.

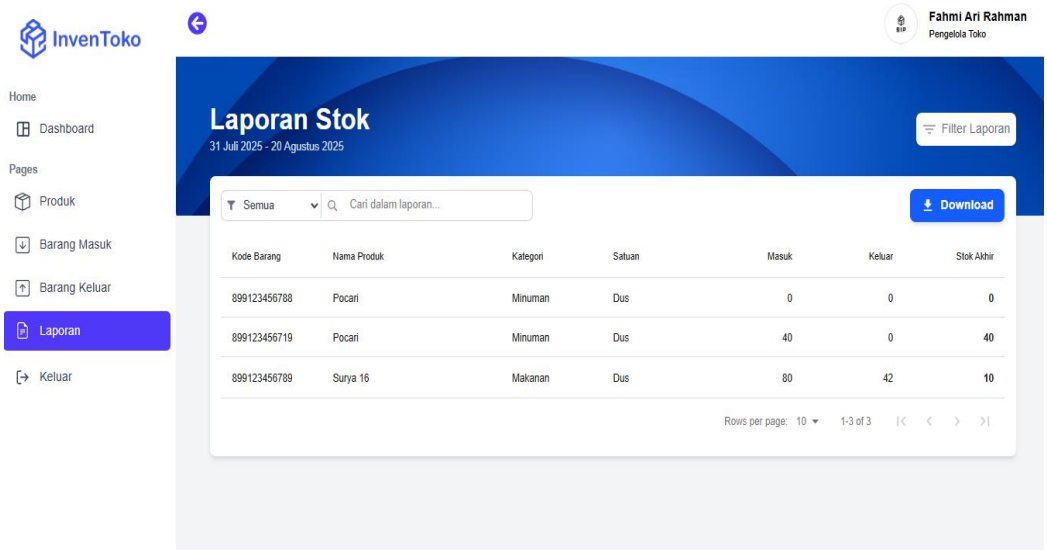

Figure 5. SIP Stock Report

The implementation of the SIP application has had a positive impact on the effectiveness of merchandise management at Toserba HM. Based on trial results and observations, this system helps business owners record inventory more quickly, accurately, and in a structured manner. Automatic recording and the *barcode scanner feature* have been proven to reduce input errors and speed up the transaction process. These findings align with research by Pangaribuan et al. (2023), which states that a web-based system can improve stock recording accuracy by up to 30%. These findings also support research by Harlan et al. (2023), which explains that the implementation of digital technology in MSMEs contributes to increased operational efficiency.

CONCLUSION

This study aims to develop and test the effectiveness of a SIP web application in supporting the inventory management process at HM Department Store. The results show that this application can improve the efficiency and accuracy of stock recording, supported by an automated system and integrated *barcode scanner*. These features help business owners minimize input errors, speed up transactions, and strengthen internal control systems through accurate and documented data. These findings align with research by Pangaribuan et al. (2023) and Harlan et al. (2023) which confirms that implementing a web-based system can improve recording accuracy and operational efficiency in MSMEs.

This study has limitations, namely that the application testing is still limited to a single research object. Future research is recommended to expand the research object to various MSME sectors. Furthermore, the researcher also recommends the addition of additional features, such as financial system integration and *cloud system support* , the aim of which is to increase the application's scalability. For the owner of the HM Department Store, it is hoped that the SIP web application will continue to be utilized and developed to optimize inventory management and become an example of the application of digital technology that supports MSME performance in the future.

REFERENCES

Adenowo, A. (2013). *Software Engineering Methodologies: A Review of the Waterfall Model and Object-Oriented Approach.*

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.

Handoko, M., Erwin, E., Nathan, N., Megawan, S., & Gohzali, H. (2024). Inventory Management Using Mobile and Web Applications. *SIFO Mikroskil Journal, 25* (2), 21–38.

Harlan, FB, Yulinda, & Zainuddin, M. (2023). Analysis of needs and design of a website-based MSME inventory management system in the Society 5.0 era. *Journal of Computer Science and Business (JIKB), 15* (2), 182–189.

Haryanto, H., & Prawira, J. (2025). Financial management and inventory stock at Glory Furniture in Batam City. *Indonesian Journal of Community Service, 6* (1), 540–549.

Horngren, C.T., Sundem, G.L., & Stratton, WO (2020). *Introduction to management accounting* (16th ed.). Pearson.

Moussa, A. (2017). *Entrepreneurship and SMEs development in emerging economies.* Cambridge Scholars Publishing.

Pangaribuan, JJ, Margono, H., Barus, OP, Pratama, YA, & Maulana, A. (2022). Sales, Purchase, and Inventory Information System Design at SMEs. *1st International Conference on Technology Innovation and Its Applications (ICTIIA)* , IEEE.

Pfleeger, S. L., & Atlee, J. M. (2009). *Software engineering: Theory and practice* (International Ed. 4th). Pearson.

Porter, G. A., & Norton, C. L. (2018). *Financial accounting: The impact on decision makers* (10th ed.). Cengage Learning.

Pratomo, D. (2024). Web-based inventory management system for small and medium enterprises in the digital era. *Jurnal Dunia Data, 1* (1).

Stake, R. E. (1995). *The Art of Case Study Research.* SAGE Publications.

Stevenson, W. J. (2020). *Operations management* (14th ed.). McGraw-Hill Education.

Sugiyono. (2019). *Quantitative, qualitative, and R&D research methods* (2nd ed., 1st ed.). Alfabeta.

Warren, C.S., Reeve, J.M., & Duchac, J.E. (2021). *Accounting.* Cengage Learning.

Weygandt, J.J., Kimmel, P.D., & Kieso, D.E. (2020). *Accounting principles* (14th ed.). Wiley.

Yang, F., Chen, G., & Zhao, L. (2018). Web-based inventory management system: A case study of mid-sized retail businesses. *Journal of Business Information Systems, 45* (2), 112–127.

Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods* (6th ed.). SAGE Publications.