

Enhancing Agricultural Industry's Performance Through Web-Based Inventory Accounting Information System Development

Meningkatkan Kinerja Industri Perkebunan Melalui Pengembangan Sistem Informasi Akuntansi Persediaan Berbasis Web

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ABSTRACT

Perumda Perkebunan Kahyangan, which is one of the industries in the plantation sector, is experiencing difficulties in managing plantation commodity inventory, this is because recording is still done manually. The research aims to develop a web-based inventory accounting information system called SIMEDi which is in accordance with the needs of Perumda Perkebunan Kahyangan. The method used in this research is a case study faced by Perumda Perkebunan Kahyangan regarding inventory management which is still done manually, which has an impact on company performance. Meanwhile, the method used to develop web-based SIMEDi applications is the agile method, which allows the development process to be carried out simultaneously to produce quality applications that suit user needs through the stages of planning, analysis, design, implementation, testing, deploy and maintenance. This research produces a SIMEDi inventory accounting information system that has functions and features that accommodate adequate inventory management for companies including plantation and warehouse stock initiation transactions, harvest, internal procurement, external procurement, production, sales, plantation and warehouse stock adjustments and price input. acquisition. This application also helps top management not only know the amount of inventory held at each plantation and warehouse location, but also the profits and costs of each inventory sold. The SIMEDi application provides data and information support that is precise, accurate and can be accessed in real time via the website, so that companies are able to meet market needs well.

Keywords: Agriculture, inventory, market, performance, system.

ABSTRAK

Perumda Perkebunan Kahyangan yang merupakan salah satu industri di sektor perkebunan mengalami kesulitan dalam mengelola persediaan hasil

komoditas perkebunan, hal ini disebabkan karena pencatatan masih dilakukan secara manual. Penelitian bertujuan untuk mengembangkan sistem informasi akuntansi persediaan berbasis web yang diberi nama SIMEDi yang sesuai dengan kebutuhan Perumda Perkebunan Kahyangan. Metode penelitian adalah kualitatif dengan pendekatan studi kasus yang dihadapi Perumda Perkebunan Kahyangan berkaitan pengelolaan persediaan yang masih dilakukan secara manual sehingga berdampak pada kinerja perusahaan. Metode yang dipergunakan untuk mengembangkan aplikasi SIMEDi berbasis web ialah metode agile, yang memungkinkan proses pengembangan dilakukan secara simultan untuk menghasilkan aplikasi yang berkualitas dan sesuai dengan kebutuhan pengguna melalui tahapan perencanaan, analisis, perancangan, implementasi, pengujian, pelepasan dan pemeliharaan. Penelitian ini menghasilkan sebuah sistem informasi akuntansi persediaan SIMEDi yang memiliki fungsi dan fitur yang mengakomodasi manajemen persediaan yang memadai bagi perusahaan meliputi transaksi inisiasi stok perkebunan dan gudang, panen, pengadaan internal, pengadaan eksternal, produksi, penjualan, penyesuaian stok perkebunan dan gudang serta input harga perolehan. Aplikasi ini juga membantu manajemen puncak tidak hanya mengetahui jumlah persediaan yang dimiliki di setiap lokasi perkebunan dan gudang, tetapi juga keuntungan dan biaya dari setiap persediaan yang terjual. Aplikasi SIMEDi memberikan dukungan data dan informasi yang tepat, akurat dan dapat diakses secara real time melalui website, sehingga perusahaan mampu memenuhi kebutuhan pasar dengan baik.

Kata Kunci: Kinerja, pasar, perkebunan, persediaan, sistem.

INTRODUCTION

Maintaining precise and current inventory records is a fundamental requirement for organizations to effectively manage their stock levels and support informed decision-making processes (Tryana et al., 2022). An efficient inventory accounting information system is crucial in providing real-time data on the availability, location, and consumption of inventory items, enabling proactive and accurate inventory management (Shukran et al., 2017). The accounting for inventories is a significant consideration for many entities, as it directly impacts both the income statement and the statement of financial position (Haq & Suendri, 2023), that's what transpired with Perumda Perkebunan Kahyangan Jember which has inventory types in the form of agricultural products and processed agricultural products. Currently, its management is still very conventional, so that in improving the accuracy and relevance of data in decision making and also to improve the company's financial performance, especially in terms of cost efficiency, an inventory management system is needed that is able to present data in real time and

centrally that can be accessed anywhere and anytime. The obstacles faced related to inventory management at Perumda Perkebunan Kahyangan Jember are the still conventional inventory recording. So far, the recording process is still carried out through recording on paper and using excel which is inputted manually, resulting in data and information not being integrated accurately and on time. Untimely stock monitoring due to limitations also results in wasteful costs and increased storage costs. The company also finds it difficult to determine accurate cost of goods sold considering that the management of information related to inventory is also very minimal. As a result, management has difficulty in achieving the targeted financial performance. In addition, the location of the plantations spread across 5 land areas, namely 5 (five) plantation locations, namely Sumberwadung, Kalimrawan, Gunungpasang, Sumberpandan, Sumbertenggulun, results in difficulties in organizing information related to inventory in each plantation. For that, an information system regarding inventory is needed so that the company can centrally monitor inventory in real time to support financial and non-financial performance targets. In addition, the most important thing is the availability of an information system that is able to present reports related to the inventory owned by the company, as well as its mutations which are accommodated through the Development of a Web-based Inventory Accounting Information System (SIMEDi) with the Agile method in an effort to optimize the company's inventory management. This application was developed to answer the needs of users at Perumda Perkebunan Kahyangan Jember, namely the Director, Inventory Staff, Plantation Employees, Marketing Department and Procurement of Goods and Services Department. Therefore, the research aims to develop a web-based inventory accounting information system called SIMEDi which is in accordance with the needs of Perumda Perkebunan Kahyangan especially those related to coffee processing from upstream to downstream which is the main commodity in Perumda Kahyangan Jember.

Inventory management is a critical component of profitability, and an effective system should incorporate techniques such as maintaining accurate inventory records, forecasting demand, understanding lead times, and estimating

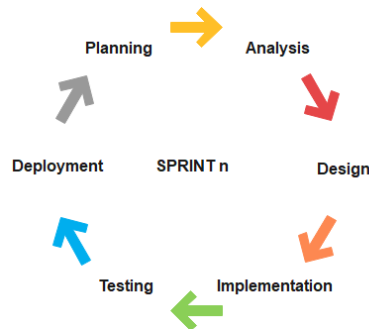
holding, ordering, and shortage costs (Kolawole et al., 2019). More frequent feedback and, in certain situations, real-time control capabilities have been made possible by recent advancements in information technology, giving businesses better visibility and responsiveness in their inventory management (Cotteleer & Bendoly, 2006).

A web-based inventory accounting information system is a cutting-edge tool made to make real-time inventory and financial transaction administration easier (Misahuaman et al., 2021). A user-friendly online interface makes it possible to access a variety of integrated services, including handling orders, keeping track of stock levels, and collecting financial data. Cloud technology gives organizations the ability to access critical data from any location at any time using any device with an internet connection (Bose et al., 2022). This accessibility enables decision-makers to react quickly to shifts in market demands and inventory levels (Kumalasari et al., 2023).

RESEARCH METHODS

This research uses a qualitative method with case study approach in the Agricultural Industry, specifically Perumda Kahyangan Jember, using primary data collection techniques through interviews with the Finance Director, related staff and also secondary data through document studies including Organizational Structure, Standard Operating Procedures, Company Profile. A case study approach in information system development is a research method that involves an in-depth exploration of a specific instance of a system development project (Maciaszek & Liong, 2004). This approach allows for detailed analysis and understanding of the factors that contribute to the success or failure of a system, as well as the context in which the system operates. Exploring user needs through a case study approach in system development is crucial for creating systems that are user-centered, functional, and successful. Additionally, the agile approach to system design is employed, with the phases and procedures of system design organized into sprints. The system's ability to adjust to all current business changes makes this approach suitable. The stages of system development include: 1. Planning 2. Analysis 3.

Design 4. Implementation 5. Testing 6. Deployment and Maintenance (Williams, 2010). The agile approach was chosen because it can simultaneously provide feedback on system development so that the resulting system will be more in line with user needs compared to other approaches such as waterfall which follows the system development hierarchy.



Source: Rabbani, (2020) reprocessed

Figure 1. Agile Application Development Method

Agile methodology has become a potent paradigm shift in the field of application development, upending conventional methods and changing how applications are developed. Agile has emerged as the mainstay of contemporary application development methodologies due to its emphasis on teamwork, adaptability, and client focus (Jain et al., 2018). Iterative development, in which projects are divided into smaller, more manageable iterations known as sprints, is the foundation of agile's fundamental ideas. Planning, development, testing, and deployment are all part of each sprint, which enables the continuous delivery of functional applications. Teams may adapt to shifting requirements and provide value incrementally with this iterative strategy (Abrahamsson et al., 2017). Accordingly, this agile approach is thought to be the most suitable for creating the inventory information system at Perumda Perkebunan Kahyangan Jember in order to generate high-quality applications that satisfy requirements.

RESULT AND DISCUSSION

The agricultural industry faces unique challenges when it comes to inventory management. Plant diseases such as weeds and other diseases are challenges that encourage agricultural industries to implement inventory control seriously (Yap et

al., 2024). A stable and flexible inventory system is necessary due to perishable agricultural products, supply and demand variations, and intricate logistical factors (Shen et al., 2010). The use of web-based inventory accounting information system is one remedy that has drawn more and more attention. For agricultural enterprises, efficient inventory management may be a major source of income and competitive advantage (Srinivasan et al., 2017). Establishing an efficient and effective inventory system to obtain the right quantity of products of the right quality, from the right source, and to have the products delivered to the right place at the right price can have a positive influence on a company's profit margins and overall cost structure (Yadav et al., 2024). However, achieving this is constrained by issues of competition, profitability, product harvest and other relevant conditions. Failure on the agricultural management may lead to declining or even loss of value of a commodity being distributed. The recent advent of technologies and the IT explosion can bring a greater impact in the process of storing, tracking, distributing and monitoring perishable agriculture produce. Furthermore, the system enhances collaboration among various departments, ensuring that sales, procurement, and finance teams operate with a unified view of inventory status. The implementation of a web-based inventory accounting information system also helps minimize errors associated with manual entries and improves data accuracy (Hasibuan & Alda, 2024). Automated reporting features enable businesses to generate insightful analytics, aiding in forecasting and strategic planning. All things considered, this system is a strong instrument that helps an organization's overall financial performance in addition to making inventory management easier.

The business processes accommodated through the SIMEDi application are initiation activities for plantation stock and also warehouse stock to input the initial balance of green bean inventory and processed coffee products, harvest activities are activities carried out by the plantation section in order to record the results of the green bean harvest, internal procurement activities carried out by the warehouse for green bean inventory on the plantation which will be processed into processed coffee, either in the form of roasted coffee or ground coffee, etc., external procurement activities are initiated by the user to request products from vendors

through the procurement section, production activities are carried out by the production section to process green beans with a certain quality into processed coffee by utilizing green bean raw materials and external products originating from vendors, sales activities are carried out by the sales section for plantation and warehouse inventory, adjustments to plantation and warehouse stock can be carried out by the plantation and warehouse sections if there are abnormal conditions related to differences between physical inventory and recording. In this system, there are 12 roles that are accommodated to carry out their authority according to the company's operating standards. Among them are inventory staff, inventory supervisors, plantation staff, head of plantations, head of marketing, marketing staff, marketing supervisor, finance and accounting Staff, head of finance and accounting, head of procurement subdivision, director and admin. The roles provided by the system will accommodate user needs according to the SOP and authority held by each user.

Tabel 1. Role and Access

No	Role	Access
1.	Director	View Information Related To The List: 1. Dashboard 2. Plantation And Warehouse Inventory 3. Warehouse Internal Procurement To The Plantation 4. Warehouse External Procurement To Vendors 5. Warehouse Production 6. Plantation And Warehouse Sales
2.	Plantation Staff	1. Harvest Input 2. Plant Stock Adjustment Input 3. Plant Stock Initiation 4. Viewing Garden Reports
3.	Head of Plantations	1. Approve Harvest 2. Approve Plant Stock Adjustment 3. Approve Plant Stock Initiation 4. Approve Internal Procurement 5. View Plant Stock Report Information
4.	Inventory Staff	1. Internal Procurement Input 2. External Procurement Input 3. Production Input 4. Initiate Warehouse Stock 5. View Inventory Report Information 6. Approve Receipt
5.	Head of Marketing	1. Approve Internal Procurement 2. Approve External Procurement

6.	Inventory Supervisors	<ol style="list-style-type: none"> 1. Approve Production 2. Approve Warehouse Stock Initiation 3. View Inventory Report Information, Production Report, Internal and External Procurement Report
7.	Marketing Staff	<ol style="list-style-type: none"> 1. Initiation Of Plantation and Warehouse Sales 2. Viewing Plantation and Warehouse Sales Report Information
8.	Marketing Supervisor	<ol style="list-style-type: none"> 1. Approve Plantation and Warehouse Sales 2. View Plantation and Warehouse Sales Report Information
9.	Finance and Accounting Staff	<ol style="list-style-type: none"> 1. Input Cost of Good 2. View Sales Reports, Cost of Goods And Inventory Of Plantations And Warehouse
10.	Head of Finance and Accounting	<ol style="list-style-type: none"> 1. Approve Cost of Good 2. View Sales Reports, Cost of Goods And Inventory Of Plantations And Warehouse
11.	Head of Procurement Subdivision	Approve External Procurement
12.	Super Admin	Can Access All Features

Source: data processed by the author, 2024

This is also implemented in the system design to create adequate internal control. Each role can only access activities and data according to the authority they have. This application is also designed to accommodate dual controls in every activity, so that data input always goes through superior approval.

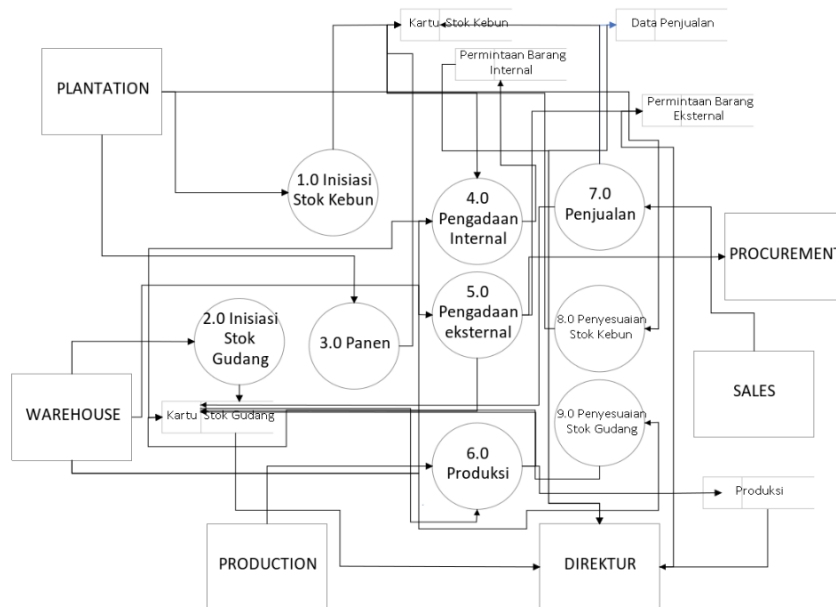


Figure 2. DFD Level 0

Source: data processed by the author, (2024)

Based on the analysis of user needs, an inventory accounting information system application called SIMEDi was developed.

Tabel 2. User Needs

No	User Needs
1	Developing a web-based system makes the input and output data process more accurate and accountable compared to manual ones.
2	Real time inventory data, centralized, accessible anytime
3	Accommodates the entire inventory management process from upstream to downstream including: harvest, internal procurement, external procurement, production, sales.
4	Information on incoming and outgoing goods flow
5	Application can calculate profits from product sales
6	Presents the quantity and value of inventory per plantation and warehouse location
7	Application has a user friendly reporting dashboard

Source: data processed by the author (2024)

The SIMEDi inventory accounting information system application produces a user-friendly interface with adequate data integrity in sprints through stages: planning, analysis, design, implementation, testing, and deployment. SIMEDi was deployed to Perumda Kebun Kahyangan to answer problems experienced by the company and to be able to present relevant and reliable reports that support decision making (Stefanov, 2016). Rapid developments in internet-enabled technologies, especially the Internet of Things, have drastically changed how accounting and inventory management are practiced (Yilmaz & Hazar, 2019). Web-based technologies have made it possible for companies to create increasingly complex and effective inventory accounting information systems. Foremost, web-based systems offer the advantage of improved timeliness and accuracy of financial information, as the use of the Internet enables financial management to be more timely and changes the method of communication, increasing communication and exchange between personnel (Li & Wang, 2021). Furthermore, web-based inventory management systems provide real-time control capabilities, with several operating systems now available for monitoring inventory levels and triggering the placement of orders. The application of these methods allows the executive of inventory to be proactive, accurate, and effective (Obadire et al., 2022). Additionally, the use of web-based systems facilitates the capture of non-financial

information to support the financial information for better decision-making. With the high mobility of plantation employee, this application can be accessed via mobile and supports mobile displays, making it easier for workers to access data and input inventory data into the SIMEDi application.

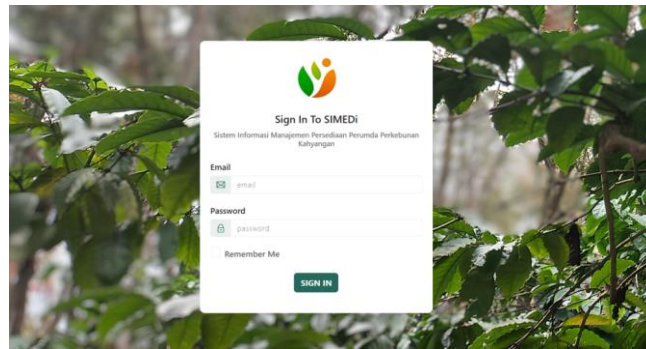


Figure 3. Signin Page

Source: data processed by the author, 2024

On the SIMEDi dashboard page, top management can see a summary of reports related to details of warehouse stock mutation, plantation stock, production monitoring, and sales profits per each warehouse or plantation location in a certain period.

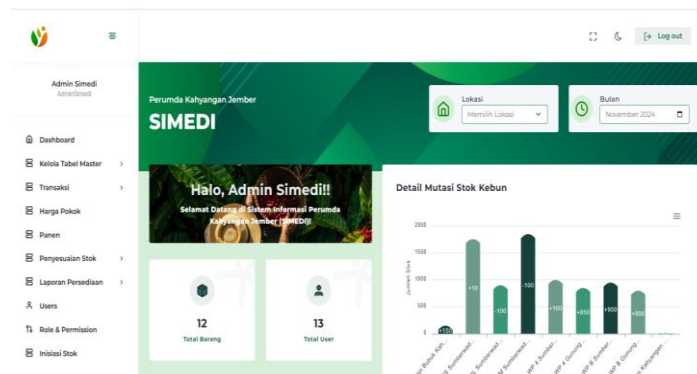


Figure 4. Dashboard SIMEDi

Source: data processed by the author (2024)

SIMEDi is also equipped with a master table management feature of units, categories, locations, goods and vendors, with the main features namely internal procurement transactions, external procurement, production, sales, harvest, plantation and warehouse stock adjustments, as well as plantation and warehouse stock initiation.

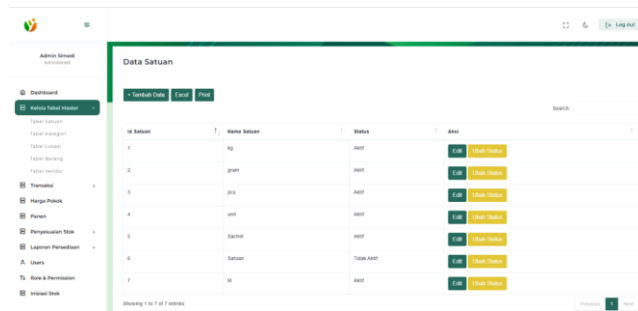


Figure 5. Master Tabel Page
Source: data processed by the author (2024)

In the warehouse stock initiation feature, inventory staff can input initial stock, select items, select transaction dates, and input stock quantities. Next, the inventory supervisor can authorize stock initiation by approving or not. Both inventory staff, supervisors and directors can view stock initiation reports. In the plantation stock initiation feature, plantation staff can input initial stock, select items, select transaction dates, and input stock quantities. Next, the head of plantation can authorize stock initiation by approving or not. Both plantation staff, head of plantation and directors can view stock initiation reports. In the harvest feature, plantation staff input green bean by selecting items, selecting the transaction date, and inputting the quantity which are then authorised by the head of plantation. Both plantation staff, head of plantation and directors can see harvest reports. In the external procurement feature, inventory staff can input requests for goods by selecting goods and vendors, selecting transaction dates, inputting the quantity requested and then the head of marketing can carry out authorization. When the goods arrive, the inventory staff inputs the receipt of goods. Both inventory staff, head of marketing and directors can view the external procurement report.

In the internal procurement feature, inventory staff can input requests for goods by selecting items, selecting the transaction date, inputting the quantity requested and then the head of marketing can carry out authorization and the head of plantations can confirm approval of requests for plantation commodities. When the goods arrive, the inventory staff inputs the receipt of goods. Both inventory staff, head of marketing, head of plantations and directors can see the internal procurement report. In the production feature, inventory staff can select raw

materials and finished goods, select the transaction date and input the amount of raw materials needed and finished goods produced. Next, the inventory supervisor carries out authorization. Both inventory staff, inventory supervisors and directors can view production reports.

Kode	Nama Produk	Lokasi	Deskripsi Barang	Unit	Satuan	Tanggal	Aksi
BR0242	WIS	Sumberrejo	Ugal-Batu	175	kg	15-10-2024	-
BR0243	WIS	Sumberrejo	Ugal-Batu & Inapan-Bagan Perumahan UGA	1000	kg	27-10-2024	-
BR0242	WIS	Sumberrejo	Ugal-Batu	100	kg	20-10-2024	-
BR0242	WIS	Sumberrejo	Ugal-Batu	100	kg	16-10-2024	-
BR0243	WIS	Sumberrejo	Ugal-Batu & Inapan-Bagan Perumahan UGA	100	kg	16-10-2024	-
BR0247	WIS	Sumberrejo	Ugal-Batu & Inapan-Bagan Perumahan UGA	100	kg	16-10-2024	-
BR0243	WIS	Sumberrejo	Ugal-Batu & Inapan-Bagan Perumahan UGA	100	kg	16-10-2024	-

Figure 6. Transaction Page
Source: data processed by the author, 2024

In the sales feature, marketing staff can input sales of goods by selecting goods and consumers, selecting the transaction date, inputting the number of goods sold and then the marketing supervisor can carry out authorization. Both marketing staff, marketing supervisors, heads of finance and accounting and directors can view sales reports. In the warehouse stock adjustment feature, inventory staff can select the items to be adjusted and the type of adjustment to increase or decrease, select the transaction date and input the adjustment amount and then the inventory supervisor can carry out authorization.

Kode Barang	Nama Barang	Nama Lokasi	Tipe Penyesuaian	Jumlah	Stok Kebun	Keterangan
BR0242	WIS	Sumberrejo	Peningkatan		1755 kg	

Figure 7. Adjustment Stock Page
Source: data processed by the author, (2024)

Inventory staff and inventory supervisors can view warehouse stock adjustment reports. In the plantation stock adjustment feature, plantation staff can select the items to be adjusted and the type of adjustment to increase or decrease, select the transaction date and input the adjustment amount and then the plantation head can

carry out authorization. Plantation staff and plantation heads can view plantation stock adjustment reports.

Kode	Barang	Kategori	Lokasi	Total Stok	Satuan	Harga Pokok/Unit	Harga Pokok Total	Transaksi Terakhir	Tanggal Transaksi	Aksi
88123421	WIS	benakan	Sumberbungung	1750	kg	Rp 10.000	Rp 17.500.000	Adjustment	28 10 2024	[icon]
88123422	WIS	benakan	Sumberbungung	900	kg	Rp 10.000	Rp 9.000.000	Pengisian Internal	16 10 2024	[icon]
88123423	WIS	benakan	Sumberbungung	1850	kg	Rp 11.500	Rp 21.275.000	Pengisian Internal	20 10 2024	[icon]

Figure 8. Report Page

Source: data processed by the author (2024)

Apart from that, SIMEDi is also equipped with an inventory report feature which provides complete information regarding item details, category, location, quantity, unit, cost per unit, and total cost. SIMEDi has been implemented at Perumda Perkebunan Kahyangan and the system is running according to the company's needs. SIMEDi is helpful for related parties in managing inventory, especially regarding green beans and coffee processed products. This application also helps top management not only to know the quantity of inventory owned in each plantation and warehouse location, but also the profit and cost of each inventory. SIMEDi application development process which is carried out in sprints, it requires high commitment from various parties to be able to create adequate application quality in answering user needs. Each stage in system development is carried out in great detail and simultaneously so that comprehensive application can be produced to answer problems related to inventory management experienced by Perumda Perkebunan Kahyangan. SIMEDi is equipped with complete modules covering stock initiation activities, internal and external procurement, production, sales, inventory adjustments and also input of cost of goods sold. The inventory module is a very important component in the inventory accounting information system. With a complete and effective inventory module, companies can manage inventory more efficiently, accurately, and effectively. This will have a positive impact on the company's overall financial performance (Saefudin & Komalasari, 2020). Inventory management, which includes tracking, replenishing, demand

forecasting, storage management, inventory valuation, reporting, and analytics, is an essential component of business operations that has a big impact on customer happiness and profitability (Alakbarov, 2024). Businesses can lower expenses, improve operational effectiveness, and react more quickly to market demands by managing inventory well (Olaniyi & Pugal, 2024). Businesses can successfully overcome these problems by utilizing technology and putting best practices into practice. Effective inventory management will continue to be crucial to attaining competitive advantage and sustained growth as the market changes. Businesses can make technological investments to get beyond these obstacles and improve inventory management (Poornima et al., 2024). Utilizing inventory management application can streamline tracking, ordering, and reporting processes, improving overall efficiency (Chander et al., 2024).

CONCLUSION

Based on the results of the development of the web-based SIMEDi inventory accounting information system application that has been carried out, it can be concluded that the development of the SIMEDi accounting information system application can meet user needs because it provides features that can be used in recording and managing inventory, especially for the main commodity of coffee and accommodates the processing process from upstream to downstream. SIMEDi can help meet user needs related to real-time and accurate data for decision making. SIMEDi can also provide optimal support to top management to carry out supervision through the dashboard feature presented in the SIMEDi application.

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