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Information system of horticultural seed ordering at republik bibit nursery using laravel

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ABSTRACT

The integration of information technology plays a vital role in improving organizational performance and supporting sustainable agricultural practices through efficient seed management systems. The existing manual seed ordering and purchasing process at Republik Bibit Nursery has led to several inefficiencies, including inaccurate stock data, transaction errors, and difficulties in estimating seed requirements. This study aims to develop an Information System of Horticultural Seed Ordering at Republik Bibit Nursery using the Laravel framework to digitalize the ordering process and enhance operational efficiency. The primary objective is to streamline order management, enable real-time stock monitoring, track seedling growth, and assist customers in estimating seed quantities based on land size. The novelty of this research lies in the integration of e-commerce functionality with agricultural decision-support features such as growth tracking and stock forecasting—an advancement beyond conventional systems that focus solely on sales transactions. The system was developed using the Waterfall method, encompassing six stages: requirement analysis, design, implementation, testing, deployment, and maintenance. Data collection was conducted through observation, interviews, and literature review to ensure comprehensive system requirements. The implementation resulted in a fully functional web-based application featuring modules for user management, product management, transactions, and reporting. Through Black Box testing, all functional scenarios for different user roles—admin, owner, employee, and customer—achieved a 100% success rate, confirming the reliability of the system. The results demonstrate that this information system effectively minimizes transaction errors, reduces seed stock shortages, and enhances decision-making accuracy for both administrators and customers. In conclusion, the developed system provides an efficient, scalable, and sustainable digital solution that supports the modernization of horticultural nurseries and contributes to the broader digital transformation of the agribusiness sector.

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1. INTRODUCTION

The integration of information technology positively influences organizational performance, primarily through its capacity to elevate the effectiveness and efficiency of administrative functions and data management processes, ensuring speed, precision, and accuracy [1].

Amidst global population growth and the need for sustainable food production, efficient information systems management is crucial. A good information system is able to facilitate the optimization of work. One crucial aspect of agriculture is the effective and timely management of plant seeds [2].

Republik Bibit is a place to order and purchase various horticultural plant seeds. Seedlings at the Republik Bibit nursery are sown using specific techniques to produce high-quality seedlings ready for planting in large areas. Sowing is crucial, especially for delicate seeds, as planting directly in the soil can easily be washed away by water, hindering growth and even damaging the seedlings [3]. It's often observed that several problems when sowing seeds at home that can cause seedlings to fail or die. Results of seedlings that lack light are weak stems, small, and pale leaves. Excessive watering can lead to root saturation, increasing the risk of fungal, bacterial, and viral growth. Therefore, the sowing process requires several stages, care, and special techniques to ensure the seedlings grow well until they are planted in the fields.

To avoid the risk of seed failure, farmers use seedling services. The horticultural plant nursery at the Republik Bibit Nursery is a nursery for fruit and vegetable crops such as chilies, mustard greens, eggplants, cucumbers, watermelons, melons, and many other types of horticultural crops. The Republik Bibit Nursery also serves retail purchases of horticultural plant seeds or purchases using the customer's own land, also known as bulk purchases.

Ordering and purchasing plant seeds at the Republic of Seeds Nursery is still using manual method. Buyers come to the nursery to purchase or order plant seeds. Sometimes, when buyers arrive at the nursery, the seeds they want to buy are out of stock. Buyers also find it difficult to estimate the number of seeds to plant based on the size of their land, resulting in wasted goods because they buy too many seeds or have to make repeated trips to the nursery due to a shortage of seeds. Transactions are also still using manual method, resulting in frequent errors in data collection, which can be detrimental to business owners. Therefore, it is necessary to create a website with the title "Horticultural Plant Seedling Ordering Information System at the Republic of Seedlings Nursery Based on Laravel" which is expected to make it easier for admins to manage user data, make it easier for owners to view sales recaps, check seedling product stock, view available seedling products, view sales statistics, make it easier for admins to manage seedling products, transactions, orders, seedling monitoring, and make it easier for buyers to order and purchase plant seedlings, monitor the size of the ordered plant seedlings, and estimate the number of purchases needed so as to prevent waste. This website was created using the Laravel framework and MySQL as the database [4]. The novelty of this research lies in the development of an integrated horticultural seed ordering and management information system specifically tailored for Republik Bibit Nursery, which not only digitizes the ordering and purchasing process but also provides features for stock monitoring, seedling growth tracking, and demand estimation based on land area. Unlike conventional systems that focus solely on sales transactions, this system offers comprehensive functionality to support both farmers and nursery owners in reducing seed failure, minimizing waste, and improving decision-making. The contribution of this research is to provide a practical and scalable solution that enhances operational efficiency, supports sustainable agricultural practices, and serves as a reference model for the digital transformation of similar nurseries and seedling services.

2. METHOD

Problem, Solution and Data Collection

The Republic of Bibit Nursery currently conducts seed ordering and purchasing through manual methods, requiring customers to visit the nursery directly. This system limits market reach, often results in stock unavailability, and makes it difficult for buyers to calculate seed requirements based on their land area. Consequently, customers frequently experience wastage from over-purchasing or must return due to shortages, while manual transaction records are prone to errors that can harm business operations. To overcome these challenges, this study proposes the development of a website-based information system that enables online seed ordering and purchasing. The system incorporates features such as product catalogs with seed descriptions, a shopping cart, online transactions, and a calculation tool to estimate seed needs according to land size. It also includes seedling monitoring for customers, stock management to anticipate shortages, and

sales reporting for owners. These features are designed to improve efficiency, minimize errors, and expand the nursery's marketing reach. The research employed observations, interviews with the nursery owner, and a literature review of relevant studies to analyze the problems and design the solution. The findings are expected to contribute to the digital transformation of horticultural nurseries by providing a practical model for optimizing operations and supporting sustainable agriculture.

System Development Method

The method used in developing this software is the waterfall method. The waterfall method can be seen in Figure 1

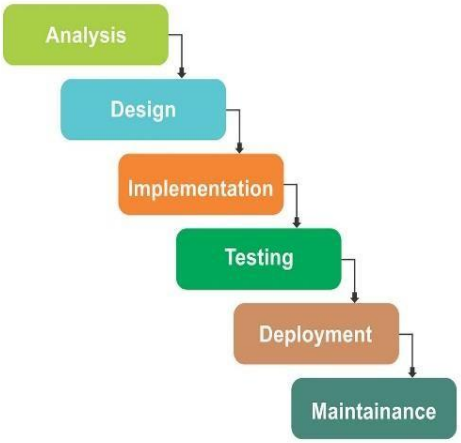

Figure 1. Waterfall method

The Waterfall method [5] is a system development method that must be completed sequentially:

Requirement Analysis

This analysis stage is conducted to find basic materials or information that can be developed into an information system. This stage can be carried out through interviews, observations, and reading previous research references.

Design

Once all the data or information has been collected, it will be easier for researchers to design the system to be developed. This design includes interface design, database structure development, table relationship design, and activity diagram design. Figma and Draw.io are used in this design phase.

Implementation

The next stage is writing the source code, or creating the program. This stage focuses on technical aspects, implementing the source code according to the previously created design. For this stage, the researcher used the Visual Studio Code text editor.

Testing

This testing phase is conducted to determine whether the program is designed to meet design requirements or whether there are any deficiencies that need to be corrected. Testing a program is essential for verifying the overall functionality of the system and minimizing errors before launching the program.

Deployment

Once the software has been successfully tested and meets all requirements, it will be deployed by the user as needed.

Maintenance

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The final stage is maintenance, ensuring the system is functioning as intended. At this stage, the system is ready for use, but once it's operational, it's possible to discover previously undiscovered errors or need to add features that aren't yet available. In addition to maintenance, this stage can also perform system improvements.

3. RESULTS AND DISCUSSIONS

The design and planning created in the previous chapter were then implemented in the creation of a website. The following is an application of the design on a website titled "Information System of Horticultural Seed Ordering at Republik Bibit Nursery Using Laravel".

Use Case Diagram

A use case diagram is a type of UML (Unified Modeling Language) diagram [6] that plays a crucial role in depicting the interaction between users and the system being developed. Using a use case diagram allows users to understand the system's functionality and how it operates. A use case diagram is shown in Figure 2.

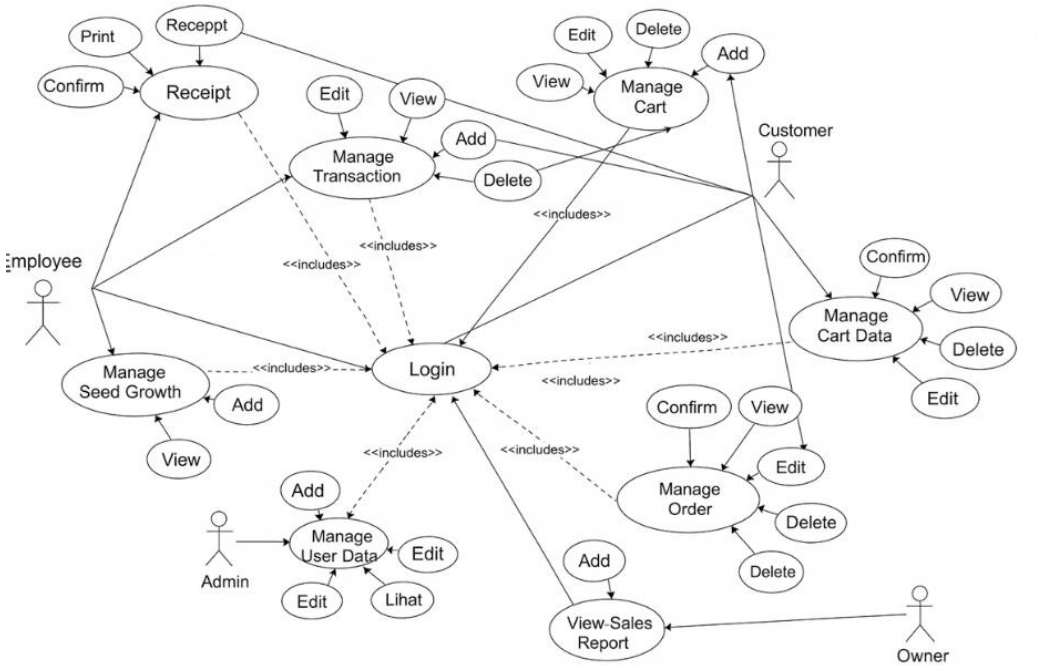

Figure 2. Use case diagram

Table Relationships

The Entity Relationship Diagram (ERD) illustrates the database structure of the Republik Bibit plant seed ordering system, comprising six core entities: User, Product, Cart, Transaction, District, and Status. It defines the relationships that manage user information, product data, shopping cart activities, transaction processing, delivery areas, and transaction statuses. Designed according to normalization principles, this ERD ensures data consistency and minimizes redundancy, providing a solid foundation for implementing an efficient and reliable database system to support Republik Bibit operations.. The relationships between tables are shown in Figure 3.

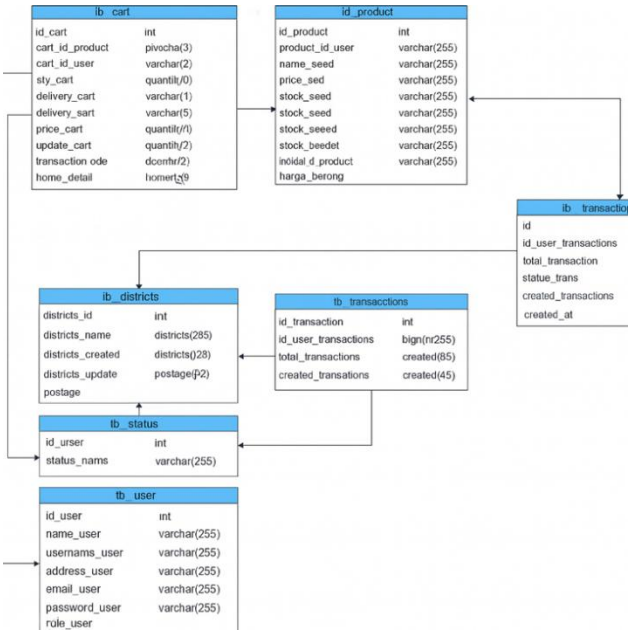

Figure 3. Entity relationship diagram (ERD)

Architecture Diagram

The system architecture diagram illustrates the interaction between users and the Republik Bibit web-based application through a client-server model. Four types of users—Admin, Owner, Employee, and Customer—communicate with the system via the Internet, sending requests and receiving displayed data in response. The Server functions as the core processing unit that handles data requests, manages application logic, and communicates directly with the Database for data storage and retrieval. The Database serves as a persistent data repository, ensuring the consistency and availability of information across all user roles. This architecture supports efficient data exchange, scalability, and centralized management, making it suitable for e-commerce systems that require reliable and secure access to information in real time.. The architecture diagram is shown in Figure 4.

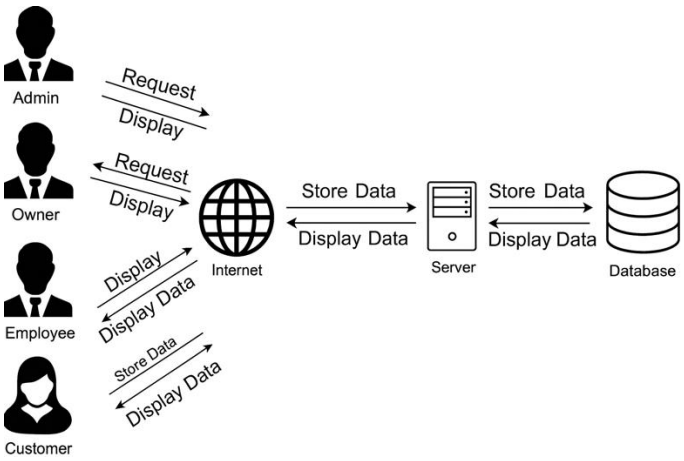

Figure 4. Architecture diagram

Landing Page

The landing page [7] is the first interface displayed when users access the web application. It serves as the primary access point and is designed to be both informative and user-friendly. The page provides options

for new users to register, existing users to log in, and visitors to access general information about the store. In addition, the landing page displays the most purchased products (best sellers), which can help new customers make informed purchase decisions. This feature also serves as a marketing tool by highlighting popular products and promoting customer trust. The landing page is shown in Figure 5.

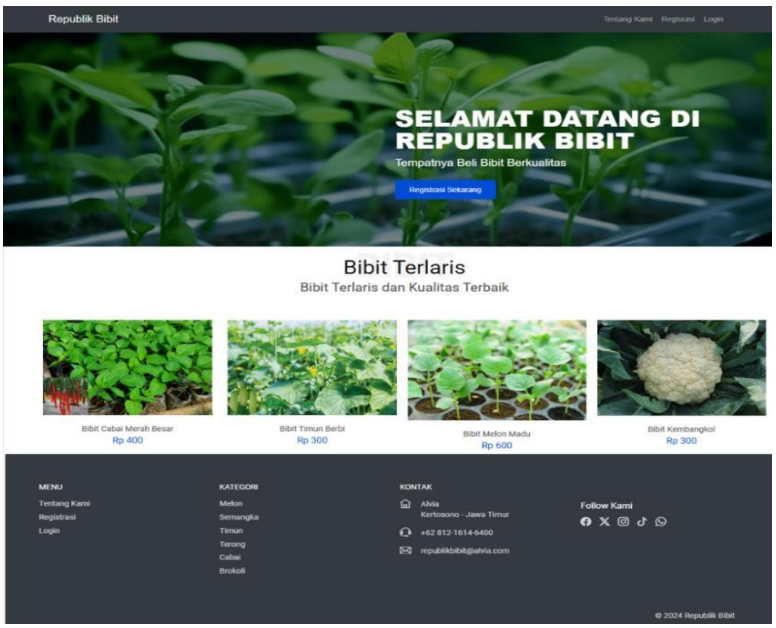

Figure 5. Landing page

About Us Page

The "About Us" page presents a brief description of the Republic Bibit Nursery, including its history, mission, and services. Unlike some restricted pages, this section is fully accessible without registration, ensuring that all visitors—whether they intend to purchase or not—can learn about the nursery's background. This transparency builds credibility and trust between the business and potential customers, which is especially important for online-based services where buyers may initially be unfamiliar with the seller. In addition to establishing trust, the About Us page functions as an informational gateway for first-time visitors. By providing clear details about the nursery's specialization in horticultural seedlings, the page helps distinguish Republik Bibit from competitors. This directly addresses the challenge of limited marketing reach under the old manual system, as visitors can now understand the scope of services remotely, even before making physical contact. A test of the about us page is shown in Figure 6.

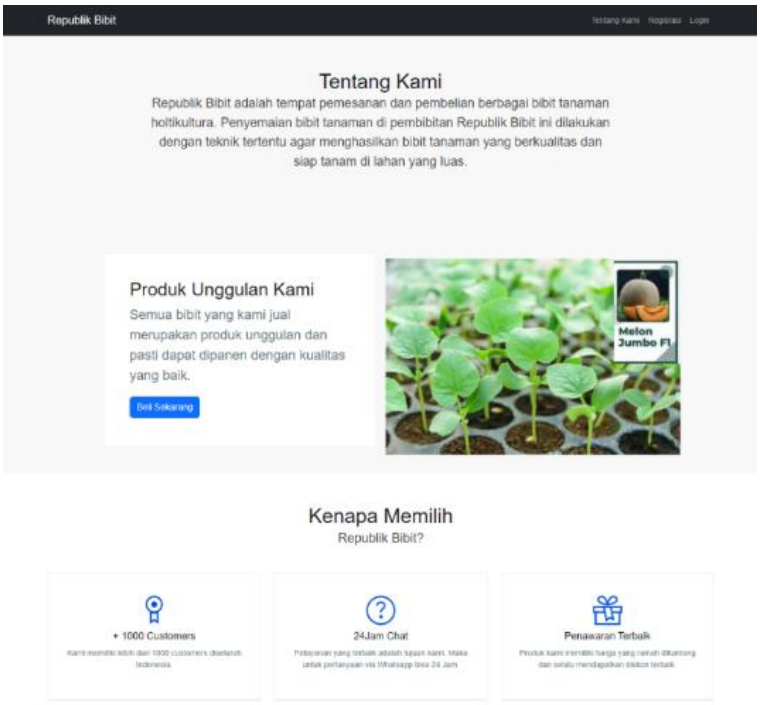

Figure 6. About us page

Login Page Testing

The login page is a critical component of the application as it provides secure access to the system's core features. To place orders, track seedling growth, or review transaction history, users must first authenticate themselves with a valid username and password. This authentication process not only protects sensitive data but also ensures that features such as order tracking and seedling monitoring are available exclusively to legitimate customers. From a usability standpoint, the login page was tested to ensure both functionality and ease of use. Error messages are provided when users input incorrect credentials, guiding them to re-enter information correctly. Additionally, options for registration and password recovery are included, making the system accessible to new customers while supporting existing users. The security provided by this page helps address the problem of data inaccuracies that occurred in the manual system, as all transactions are now tied to verified user accounts. Testing the login page features is shown in Figure 7.

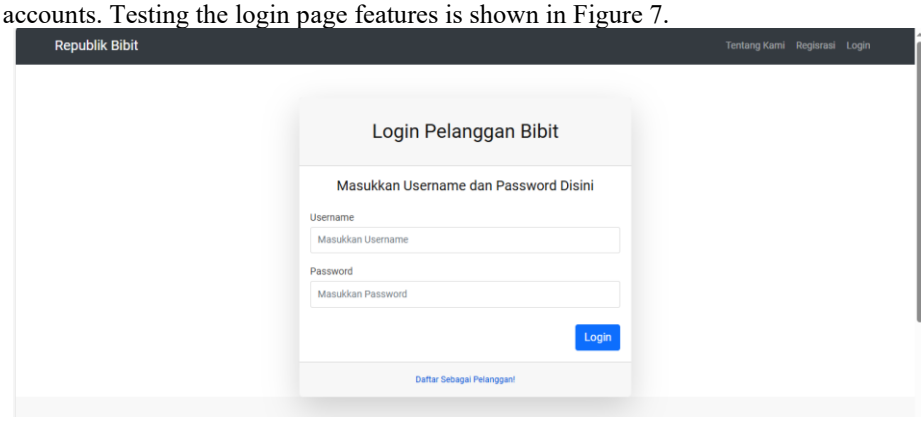

Figure 7. Login form for user

Data User Testing for Admin

This page is used to manage user data. Admins can add employee users, owner users, and view registered customer users. Testing of the admin user data feature is shown in Figure 8.

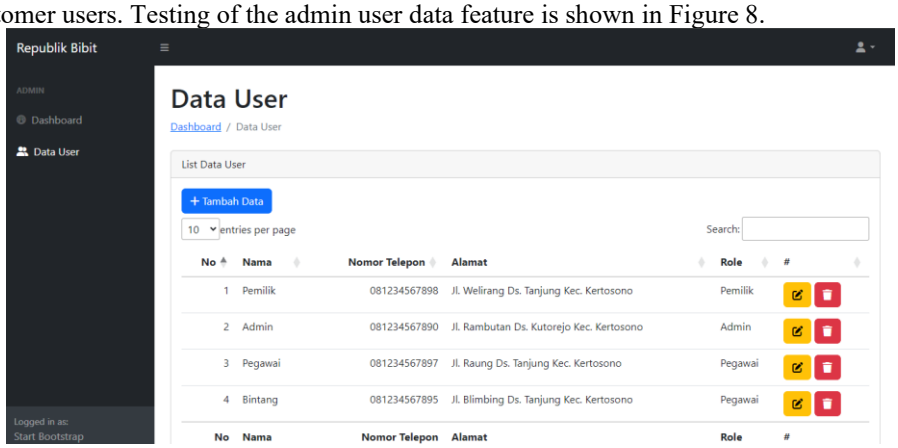

Figure 8. User data page

Dashboard Testing for Owner

The owner dashboard page displays total transaction information presented in bar graph form. This page makes it easier for owners to view total purchases. A test of the owner dashboard feature is shown in Figure 9.

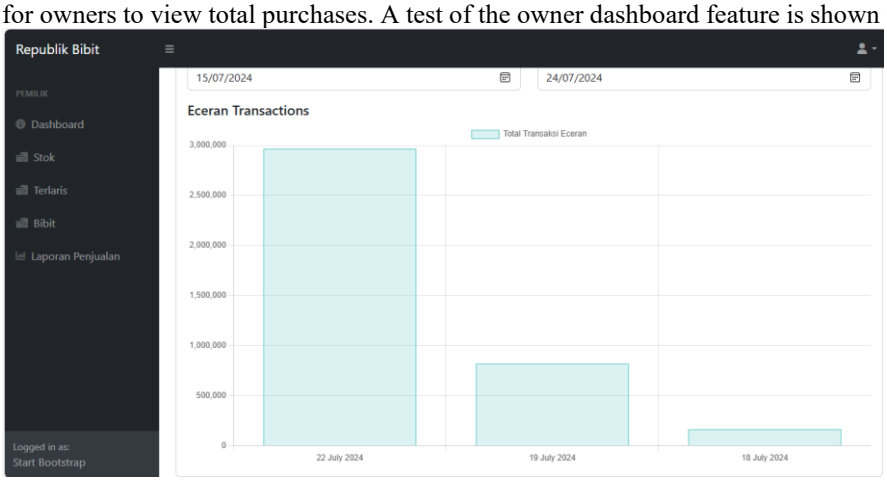

Figure 9. Dashboard page for owner

Testing Stock for Owner

This page makes it easier for owners to check seed stock. The owner's stock check is shown in Figure 10.

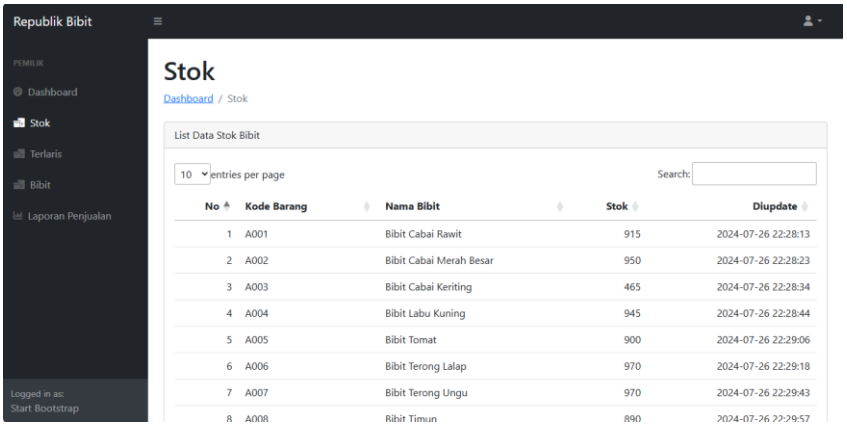

Figure 10. Stock page for owner

Testing Seed Products for Owner

On this page, the owner can see what products are currently for sale. Testing the owner's seed products is shown in Figure 11.

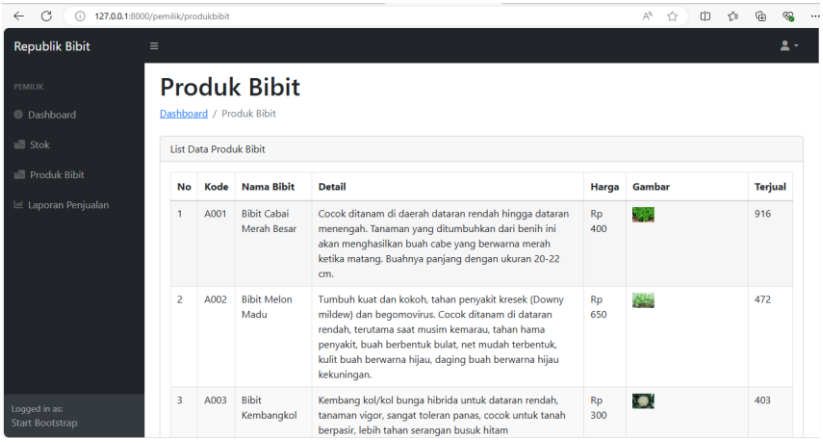

Figure 11. Seed products page for owner

Testing Sales Report

On this page, owners can view seed sales reports for both retail and wholesale purchases, based on a timeframe they can define using the start and end date features. A test of the owner's sales report [8] feature is shown in Figure 12.

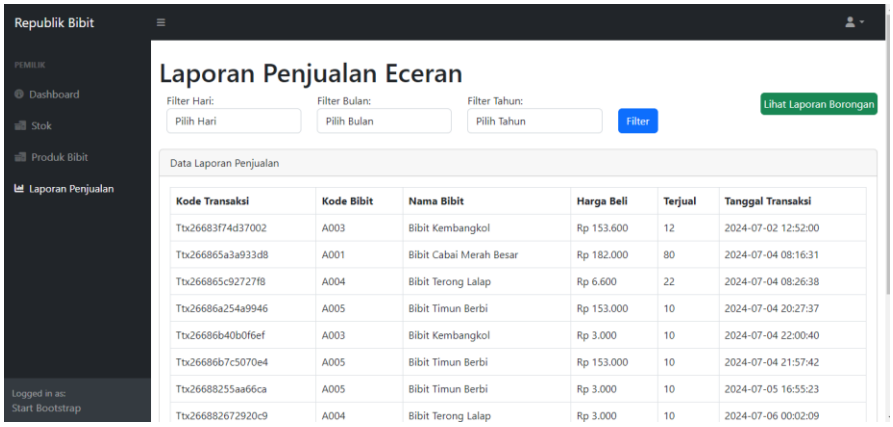

Figure 12. Sales report

Testing Seed Product Page for Employee

The seed product page is used by employees to manage seed products. Testing of the employee seed product feature is shown in Figure 13.

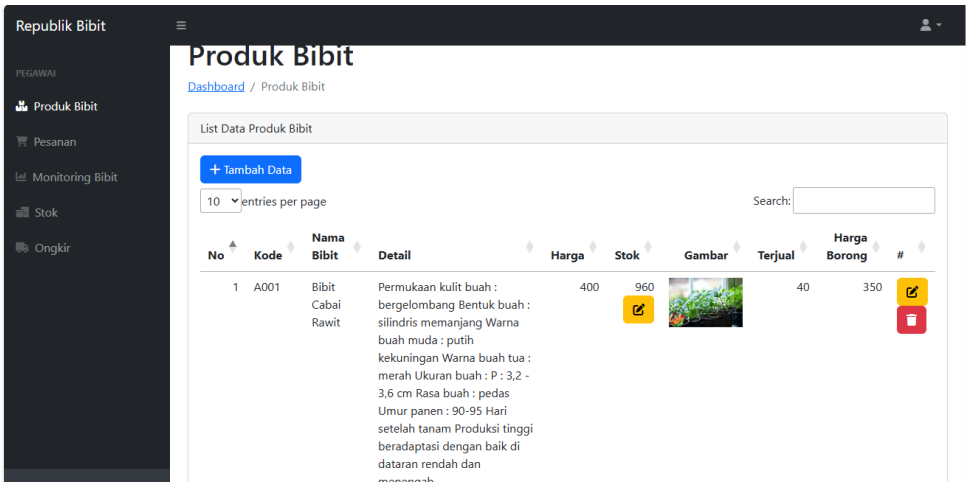

Figure 13. Seed product page for employee

Testing Orders Page for Employee

This feature displays incoming orders from customers. When an order arrives, an employee will prepare it. Testing the employee order feature is shown in Figure 14.

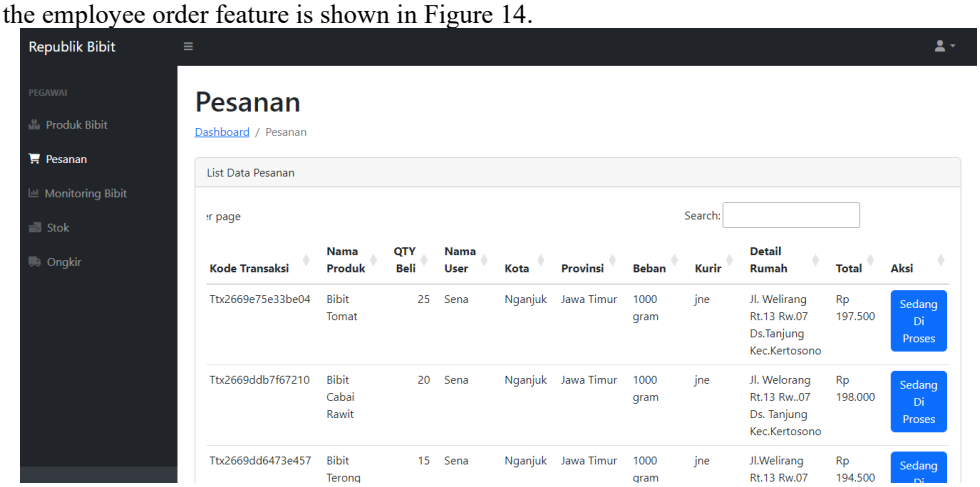

Figure 14. Orders page for employee

Testing Seed Monitoring Page for Employee

The employee seed monitoring page is a page for viewing incoming orders from customers using a purchasing system using land area (wholesale). Testing of the employee seed monitoring feature is shown in Figure 15.

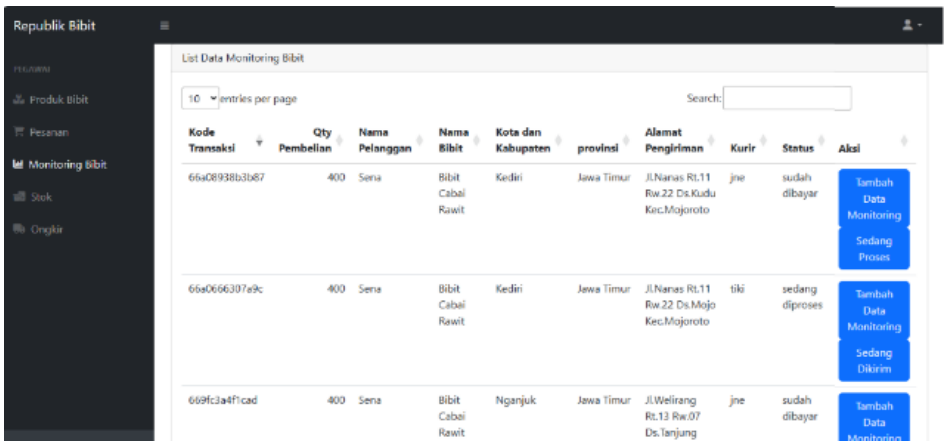

Figure 15. Seed monitoring page for employee

Testing Stocks for Employee

The stock page is a page for employees to view available seed stock. Testing the employee stock feature is shown in Figure 16.

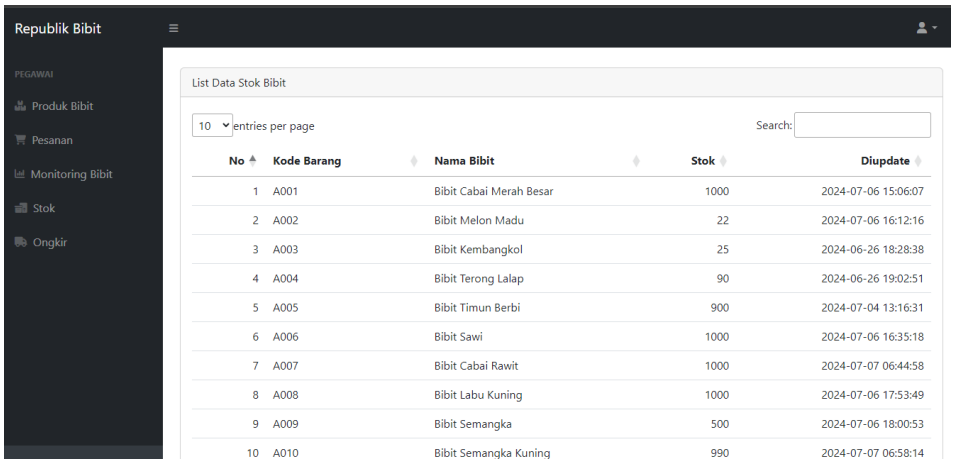

Figure 16. Stocks page for employee

Testing Available Products for Customers

After logging in, customers are able to access the website. The first page that appears is the available products page. Customers are given the option to purchase seeds individually or by the plot. A preview of the available products page is shown in Figure 17.

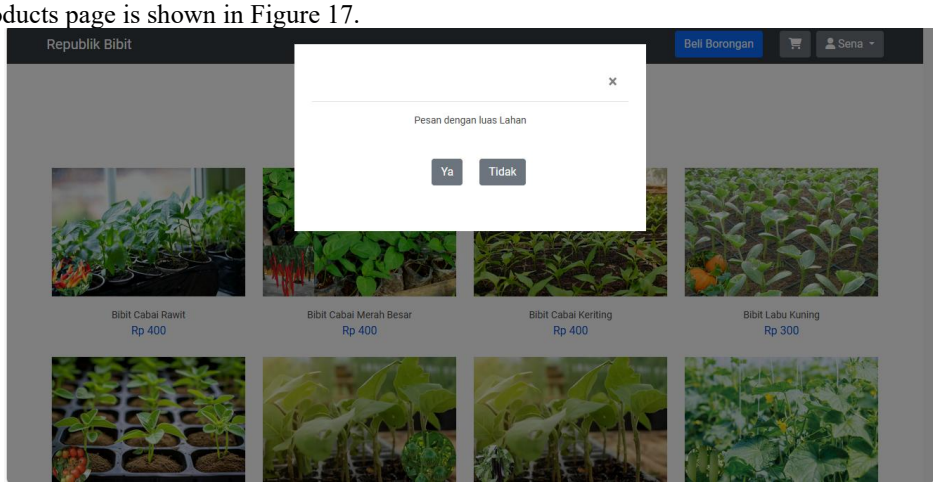

Figure 17. Available products for customers

If a customer selects the option to order by land area, a form will appear for purchasing by land area. Purchasing by land area makes it easier for customers to purchase based on the size of their land, thus avoiding under- or over-buying seeds. A test for ordering by land area is shown in Figure 18.

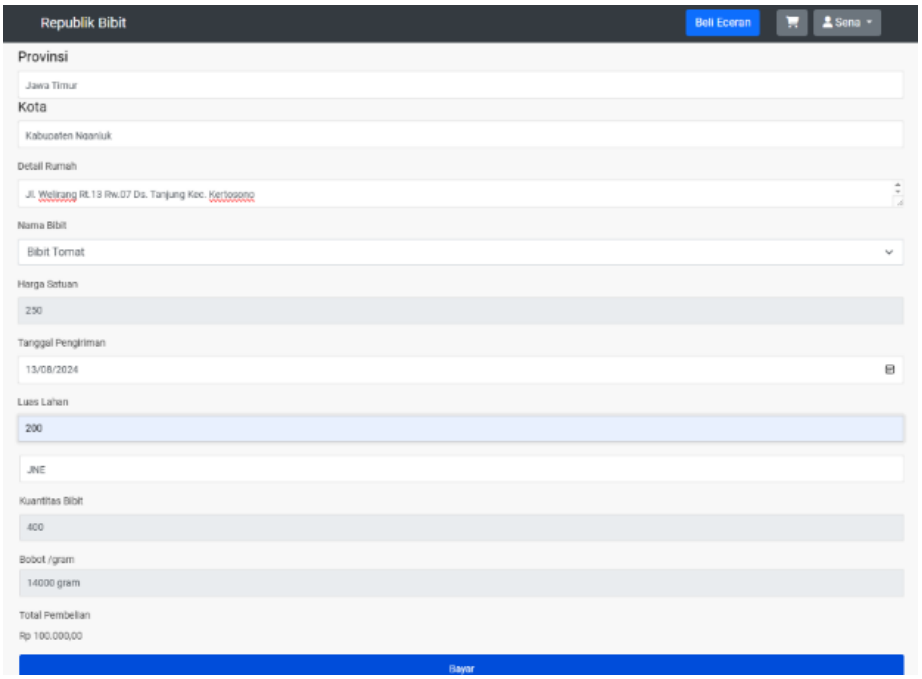

Figure 18. Ordered page includes land area

If a customer chooses not to purchase by land area, they will be directed to purchase seedlings in retail. A retail purchase test is shown in Figure 19.

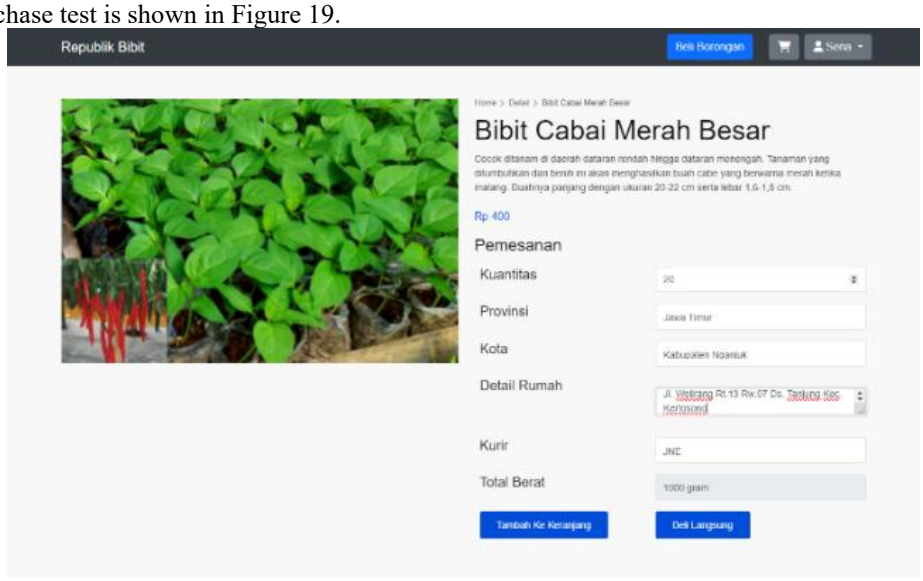

Figure 19. Retail purchase

Cart Feature Testing

Customers use the cart feature to store [9] seeds. Testing of the basket feature is shown in Figure 20.

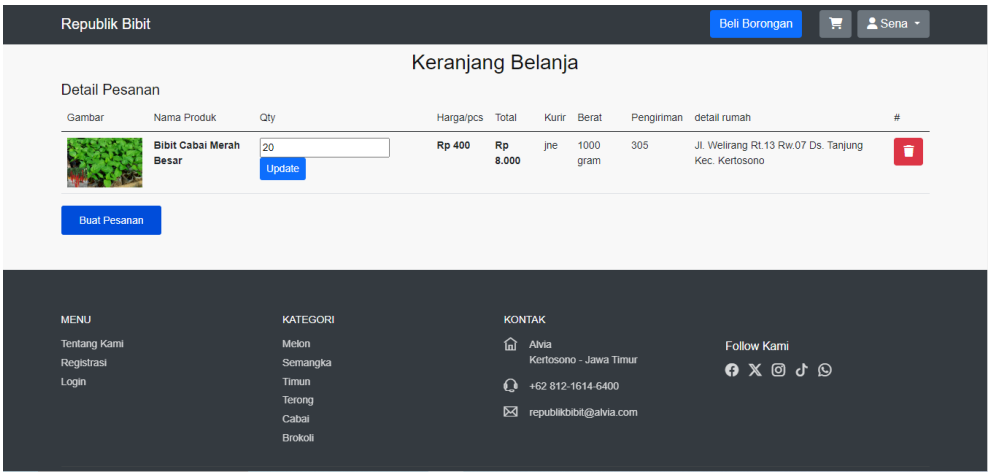

Figure 20. Cart feature

Testing Payment Feature

A transfer payment feature is provided to make it easier for customers to make payments. Customers are able to choose the payment method they prefer. A test of the payment feature is shown in Figure 21.

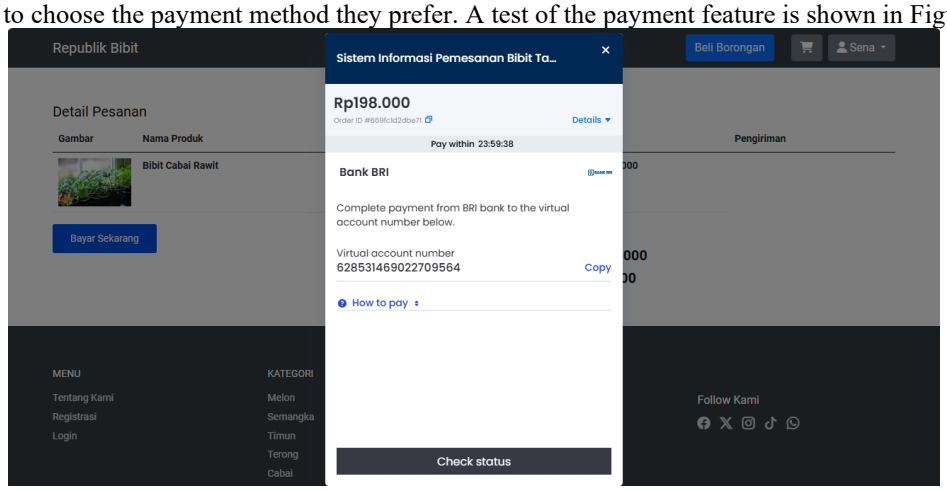

Figure 21. Payment feature

Monitoring Customer's Seed Testing

If the seedling order is based on the land area, the customer can check their order using the seedling monitoring menu. A test of the customer seedling monitoring feature is shown in Figure 22.

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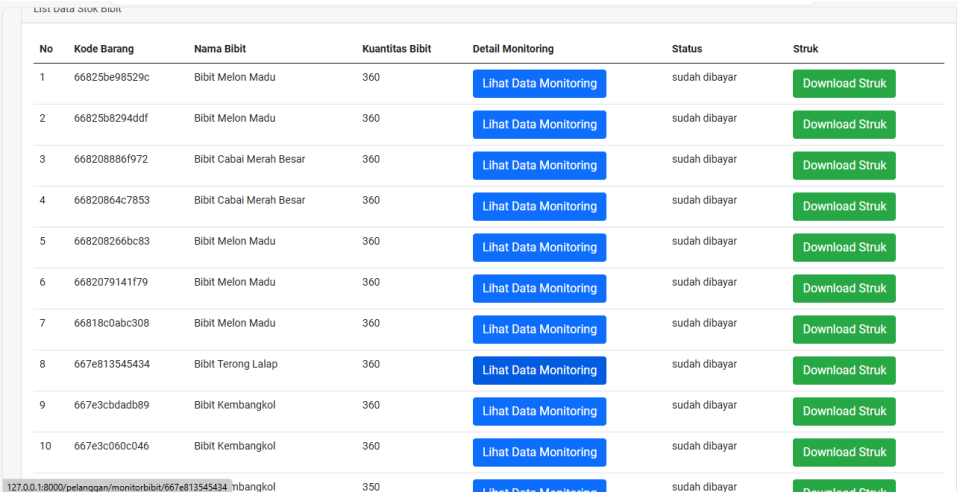

Figure 22. Seedling monitoring for employee

This research uses the Black Box testing method, where in system testing only focuses on the results of the system to ensure that the system is running according to the established provisions. Table 1 shows the testing scenario and result for Admin.

Table 1. Testing scenario and results for admin user

No.	Testing Object	Testing Scenario	Expected Result	Result
1	Login Testing	Admin enters username and password	Admin can successfully log in and access the dashboard page	Succeed
2	User Data Management	Admin manages user data	Successfully displays user data, adds new users, and edits user data	Succeed

Beside Admin there is also Owner dan Employee user, table 2 and 3 shows the testing scenario and result for Owner and Employee User.

Table 2. Testing scenario and results for owner user

No.	Testing Object	Testing Scenario	Expected Result	Result
1	Login Testing	The owner enters a username and password	Owner can successfully log in and access the dashboard page	Succeed
2	Dashboard	The owner can open the dashboard page	Successfully displays the sales report statistics page	Succeed
3	Stock Page	The owner can view the seed stock page	Successfully displays the stock page	Succeed
4	Best-Selling Products Page	The owner can view the best-selling products page	Successfully displays the top 10 best-selling products	Succeed
5	Seed Product Page	The owner can view the seed product page	Successfully displays the seed product page	Succeed
6	Sales Report	The owner can view detailed sales reports	Successfully displays the sales report page	Succeed

Table 3. Testing scenario and results for employee user

No.	Testing Object	Testing Scenario	Expected Result	Result
1	Login Testing	The employee enters the username and password	Employee can successfully log in and access the dashboard page	Succeed
2	Seed Product Page	The employee can manage seed products	Successfully displays and manages seed product data	Succeed
3	Order Management	The employee can view orders and update transaction statuses	Successfully displays order data and updates transaction status	Succeed
4	Seed Growth	The employee can view orders and add seed growth data	Successfully displays seed growth data	Succeed
5	Stock Page	The employee can view seed stock	Successfully displays seed stock data	Succeed

The last role user in this system is Customer user, table 4 shows the testing scenario and result for Customer user.

Table 4. Testing scenario and results for customer user

No.	Testing Object	Testing Scenario	Expected Result	Result
1	Registration Testing	The customer registers an account	Successfully obtains a username and password	Succeed
2	Login Testing	The customer enters the username and password	The user can successfully log in and access the dashboard page	Succeed
3	Dashboard	The customer can open the dashboard page	Successfully displays the dashboard page for customer	Succeed
4	Seed Product Page	The customer can view product details	Successfully displays the product detail page	Succeed
5	Order Management	The customer can add, edit, and delete orders	Successfully displays order data	Succeed
6	Seed Growth	The customer can view seed growth progress	Successfully displays seed growth data	Succeed
7	Shopping Cart	The customer can add, edit, delete, and view seed products	Successfully displays the seed product data	Succeed
8	Checkout	The customer can make a payment	Successfully displays the payment status	Succeed

4. CONCLUSION

The conclusion of this research is the successful design and development of the " Information System of Horticultural Seed Ordering at Republik Bibit Nursery Using Laravel" This system simplifies the purchase of seeds at retail or based on land area, so that customers are able to purchase seeds more efficiently. In addition, marketing becomes broader, covering all of Indonesia, with a simpler transaction process because it is done online. This system also makes it easier for owners and employees to manage operations, view stock, sold product, and summarize sales reports.

For the development of this information system, it can be further developed not only by building it using a website but also by developing it further into a mobile version, providing notifications to customers through WhatsApp for shipping status updates or the progress of seeds being ordered, product ratings, customer testimonials, and a notification system for employees if product stock is running low.

REFERENCES

[1] D. Y. Siringoringo, V. Sihombing, and M. Masrizal, "Sistem Informasi Penjualan Dan Persediaan Produk Peralatan Pertanian Berbasis Web," *J. Tek. Inform. dan Komput.*, vol. 4, no. 1, pp. 54–59, 2021.

[2] Suherman and I. Rahim, *Manajemen Pertanaman: Strategi Optimal Pendekatan Pertanian Terpadu*. Yogyakarta: Deepublish, 2024.

[3] W. K. Y. Swara, H. Sulistiani, and D. Darwis, "Rancang Bangun Penjualan Obat Dan Bibit Pertanian Berbasis Android," *J. Ilm. Comput. Sci.*, vol. 2, no. 1, pp. 19–28, 2023.

[4] Fadly Iriansyah, "Rancang Bangun Repository Publikasi Dosen di Universitas Negeri Manado Menggunakan Metode Waterfall," *JOINTER J. Informatics Eng.*, vol. 5, no. 01, pp. 7–13, 2024.

[5] S. Widaningsih, A. Suheri, and R. Z. Hakim, "Aplikasi Pengelolaan Data Pertanian Berbasis Web," *IDEALIS Indones. J. Inf. Syst.*, vol. 5, no. 2, pp. 69–78, 2022.

[6] R. D. R. Yusron and M. M. Huda, "Analisis Perancangan Sistem Informasi Perpustakaan Menggunakan Model Waterfall Dalam Peningkatan Inovasi Teknologi," *J. Autom. Comput. Inf. Syst.*, vol. 1, no. 1, pp. 26–36, 2021.

[7] Siska Narulita, Ahmad Nugroho, and M. Zakki Abdillah, "Diagram Unified Modelling Language (UML) untuk Perancangan Sistem Informasi Manajemen Penelitian dan Pengabdian Masyarakat (SIMLITABMAS)," *Bridg. J. Publ. Sist. Inf. dan Telekomun.*, vol. 2, no. 3, pp. 244–256, 2024.

[8] L. Qadriah, S. Achmady, M. Maryanti, H. Husaini, and U. Fajarna, "Pelatihan Desain Landing Page Untuk Pemasaran Hasil Pertanian Masyarakat Gampong Baroh Kecamatan Pidie Kabupaten Pidie," *Al Ghafur J. Ilm. Pengabdi. Kpd. Masy.*, vol. 2, no. 1, pp. 136–139, 2023.

[9] Z. H. Pathan, A. Sikandar, A. Aziz, S. A. Asghar, and M. Saleem, "User-Centric Approach to Design a Digital Shopping Cart: Enhancing User Experience in Super Stores," *J. Indep. Stud. Res. Comput.*, vol. 23, no. 21, 2025.