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Web based goat farm sales information system using rapid application development: A case study of Dompet Dhuafa Farm

Muhammad Khaibar Putra Adithia*, Junaidi Junaidi, Ade Nursyarif Tambunan
Department of Science and Technology, Universitas Nahdlatul Ulama Sumatera Utara, Medan 20125, Indonesia

ABSTRACT

This study aims to develop a web-based sales information system for Dompet Dhuafa Farm using the rapid application development (RAD) method. The study was motivated by problems in the farm's sales operations, particularly manual transaction recording, goat inventory management, and sales reporting. These activities were inefficient, prone to recording errors, and made it difficult to access up-to-date information. Previous studies have developed information systems for livestock sales and farm management. However, there is still a need for a system that combines inventory management, sales transactions, customer management, and sales reporting with online product presentation and ordering in one platform. The RAD method was chosen because it allows the system to be developed in stages through continuous user involvement and repeated improvements. RAD consists of four phases: requirements planning, user design, construction, and cutover. In the requirements planning phase, system needs were identified through observation and interviews. In the user design phase, system designs and interface prototypes were prepared and reviewed with users. The construction phase involved programming, system development, and improvements based on user feedback. Finally, the cutover phase involved system implementation and preparation for its use. The developed system integrates goat inventory management, sales transactions, customer data, and sales reports into a single web-based platform. The results show that the system improves the efficiency of data management and transaction processing while providing more organized, accessible, and accurate sales information. It also allows customers to view available goat products and place orders online. The main contribution of this study is the integration of internal sales management and online ordering into one system designed to meet the operational needs of Dompet Dhuafa Farm. Overall, the system is expected to support better sales administration, goat inventory management, and marketing activities.

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***Corresponding Author**
E-mail address: Ibaradithia94@gmail.com

1. INTRODUCTION

The rapid development of information and communication technology has changed how businesses manage their daily operations in various industries [1-3]. Technology is no longer used only to automate routine tasks but also plays an important role in improving operational efficiency, data accuracy, and business competitiveness [4-6]. This development also affects the agribusiness and livestock sectors, where digital systems can help businesses manage information, monitor resources, and improve the quality of business decisions. The use of appropriate information systems is particularly im-

portant for livestock businesses because their operations involve several interconnected activities, including inventory management, sales transactions, customer services, and business reporting [7-9].

Despite these developments, many small-scale livestock businesses in developing countries still depend on conventional management practices [10-12]. Manual recordkeeping, limited access to digital tools, and a lack of technological knowledge can prevent business owners from adopting more efficient management systems [13-15]. These limitations may affect the accuracy of business records, the availability of operational information, and the ability to respond to customer needs. Therefore, the development of affordable and practical information systems is necessary to support the digital transformation of small-scale livestock businesses. Dompet Dhuafa Farm is a goat-farming business located in Klambir Village, Hamlet 2, Hamparan Perak District, Deli Serdang Regency, North Sumatra, Indonesia. Managed by Herman Sanjaya, the business focuses on goat sales, marketing, and distribution. Its market potential is supported by demand for goats for daily consumption, religious activities such as aqiqah and qurban, and restaurant supplies. These market opportunities provide a basis for business development. However, maintaining effective operations and responding to market demand requires an adequate system for managing sales activities and livestock information. Based on observations of its operational activities, Dompet Dhuafa Farm still relies on manual procedures for several important business processes. Sales transactions are recorded manually, livestock inventory information is maintained through conventional records, and sales reports are prepared by collecting and reviewing transaction data. These procedures require additional time and effort, particularly when the number of transactions and livestock records increases. They also create a risk of recording errors, duplicated information, and difficulties in retrieving previous transaction records [16].

Another important challenge is the management of livestock inventory. Information about available goats needs to be organized according to relevant characteristics, such as type and weight, to help the owner identify suitable products and provide accurate information to potential customers. When inventory records are not stored in a centralized system, checking stock availability and updating product information becomes less efficient. This situation may also cause differences between recorded inventory data and actual livestock availability. As a result, customers may experience delays when requesting product information or confirming the availability of goats. The limitations of manual management also affect the preparation of sales reports. Daily, weekly, and monthly reports require transaction data to be collected and processed before they can be used for evaluation. This process can delay access to important business information and make it more difficult for the owner to monitor sales performance. Without organized and up-to-date reports, identifying sales trends, evaluating business activities, and making decisions based on transaction records become more challenging [17]. These conditions indicate the need for a centralized information system that connects livestock inventory, sales transactions, customer information, and reporting activities.

To address these problems, this study proposes the development of a web-based sales information system for Dompet Dhuafa Farm. A web based platform was chosen because it allows information to be accessed through different devices without requiring users to install a dedicated desktop application. The system uses a centralized database to organize livestock information, record sales transactions, manage customer data, and generate sales reports. In addition to supporting internal business activities, the system provides an online product presentation and ordering feature. This feature allows potential customers to view available goats and submit orders through the website, providing an additional channel for the farm to reach its market. Several previous studies have developed information systems for livestock businesses, including web-based platforms for farm promotion and sales, mobile applications for livestock sales management, and point-of-sale systems for recording transactions and managing inventory. Although these studies have contributed to the digitalization of livestock business activities, their main functions and implementation approaches vary. Some focus primarily on product promotion and customer access, while others emphasize transaction processing, inventory administration, or financial reporting. Therefore, there is still a need to examine how these functions can be integrated into a single platform that addresses the specific operational requirements of a small-scale goat-farming business. implementation of the web-based sales information system improves the operational efficiency of Dompet Dhuafa Farm through the digitalization and integration of data management processes. Before the system was implemented, goat inventory records, sales transactions, customer information, and report preparation were managed manually, requiring additional time and creating potential risks of recording errors and data duplication. Following implemen-

tation, these activities can be managed through a single integrated platform. Farm administrators can update and access goat inventory information, record sales transactions, and manage customer data in a more structured manner. Furthermore, accessible inventory information facilitates stock monitoring and reduces reliance on manually searching through physical records. The reporting feature also simplifies access to organized sales information, which can support operational evaluation and decision-making. Therefore, the proposed system helps streamline administrative workflows, improve data management, and support more effective sales and inventory management at Dompet Dhuafa Farm.

Research gap addressed in this study concerns the integration of livestock inventory information with sales administration and online ordering in a system designed for the operational needs of Dompet Dhuafa Farm. Rather than focusing only on online promotion or transaction recording, the proposed system connects livestock data management, sales transactions, customer information, and sales reporting within one web-based platform. This integration is intended to reduce fragmented recordkeeping, improve access to livestock and transaction information, and support a more organized sales process. The study also considers the use of the system as a digital channel through which customers can view available goat products and submit orders. Thus, the contribution of this research lies in the implementation of an integrated sales information system that connects internal business administration with online customer services in the context of goat farming.

The rapid application development (RAD) method was chosen as the system development approach because it supports iterative development and active user participation [18]. RAD consists of four main phases: requirements planning, user design, construction, and cutover. In the requirements planning phase, system requirements are identified through observation and interviews to understand the existing business processes and user needs. During the user design phase, system models and interface prototypes are developed and evaluated with users. The construction phase involves programming, system integration, and improvements based on user feedback. Finally, the cutover phase covers system implementation, testing, and preparation for operational use. This approach allows the system to be reviewed and improved throughout development, helping ensure that its functions are aligned with the actual needs of the farm. Based on these considerations, this study aims to design, develop, and implement a web-based sales information system for Dompet Dhuafa Farm using the RAD method. The system is expected to improve the management of goat inventory, sales transactions, customer data, and sales reports while providing an online platform for product presentation and ordering. Through this development, the study seeks to support more efficient sales operations, improve the organization and accessibility of business information, and contribute to the application of web-based information systems in small-scale livestock businesses.

2. RESEARCH METHODS

The research framework describes the systematic steps followed in developing the information system using the RAD method [18]. The study began with problem identification and analysis to identify the main operational problems at Dompet Dhuafa Farm and establish the objectives of system development. This initial stage provided a basis for determining the system requirements and selecting an appropriate solution to address the identified problems. Data were collected through a literature review, direct observation, and interviews to obtain relevant information about the existing business processes and user requirements [19]. The collected data were then analyzed and used as the basis for system development. The development process followed the four main phases of RAD (Figure 1): requirements planning, user design, construction, and cutover. Each phase involved user participation and iterative improvements to ensure that the developed system met the operational needs of Dompet Dhuafa Farm.

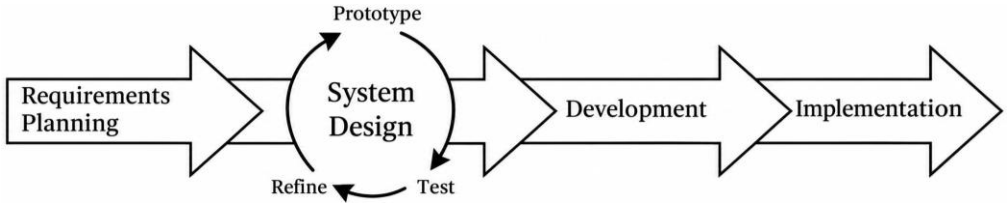


Figure 1. RAD stages.

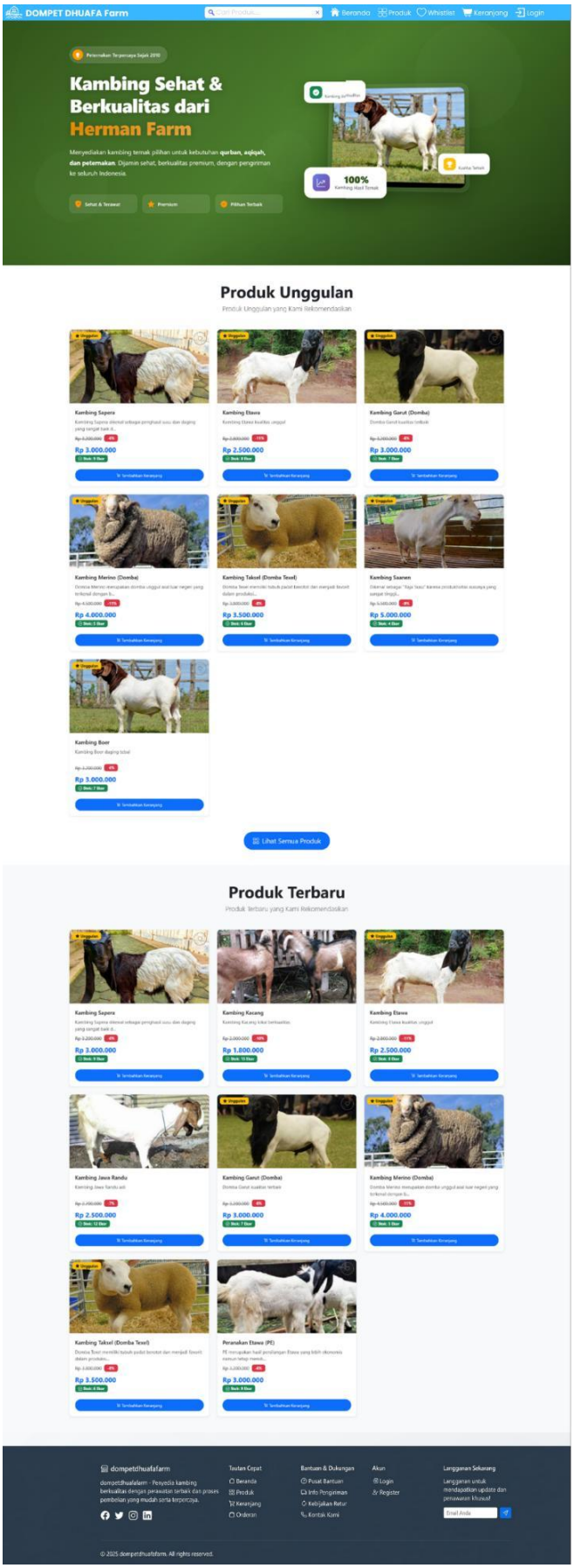


Figure 2. Main page interface.

After the development process was completed, the system was implemented and evaluated to assess its functionality and suitability for the identified requirements. The evaluation focused on determining whether the system performed according to its intended functions and supported the farm's sales management activities. Finally, the evaluation results were analyzed to draw conclusions about the developed system and its contribution to improving the management of sales operations at Dompet Dhuafa Farm.

The RAD method was used as the system development approach because it emphasized rapid application development while maintaining active user involvement. The iterative process enabled requirements to be refined through direct feedback and supported faster development without ignoring software quality. The main RAD stages were as follows:

a. Requirements Planning – identifying system requirements and defining the objectives to be achieved.
b. User Design – designing the system and developing prototypes that can be evaluated by users.
c. Construction – developing the system incrementally based on the approved prototype.
d. Cutover – conducting final testing and implementing the system for use at Dompet Dhuafa Farm (See Figure 2).

First RAD stage focuses on identifying problems, analyzing user requirements, and defining system objectives and functions. Interviews with the farm owner, observations of goat sales activities, and literature studies were conducted to identify the functional and non-functional requirements of the system. The main problem identified at Dompet Dhuafa Farm was the absence of an integrated system for managing goat sales. Transaction recording, stock monitoring, and sales reporting were still performed manually using notebooks or simple spreadsheets, resulting in risks of errors, delayed reports, and difficulties in centralized data management.

Table 1. Problem analysis.

Problem	Cause
Goat sales and transaction recording were still manual	No web-based system was available for recording transactions digitally
Goat stock and transaction monitoring was not real time	Data were not centralized and were not automatically connected
Sales reports were difficult to analyze and document	Data management was performed manually without a centralized database

Table 2. System requirements.

User	Task	System requirement
Farm owner	Monitor all transactions and goat stock	Sales dashboard, stock reports, and transaction summaries
Administrator	Record and verify sales transactions	Transactions input forms, stock management, and sales-status updates
Sales staff	Process sales transactions and update stock data	Sales form, automatic stock updates, and low-stock notifications

Based on the problem analysis (see Table 1), the proposed information system had to support the farm owner, administrator, and sales staff in managing goat sales transactions effectively (see Table 2). The system was expected to provide transaction recording, stock monitoring, sales reporting, and a dashboard to support monitoring and decision-making.

3. RESULTS AND DISCUSSIONS

Developed web-based system provided a customer-facing sales platform and an administrative dashboard for managing products, transactions, users, and sales information. The following subsections describe the main interfaces and the results of system testing.

3.1. Registration Page

Registration page is designed to allow new users to create an account before accessing the system (see Figure 3). Through this page, users are required to provide the necessary personal information in the registration form to establish their account credentials. The registration process enables user data to be recorded and managed regularly within the system.

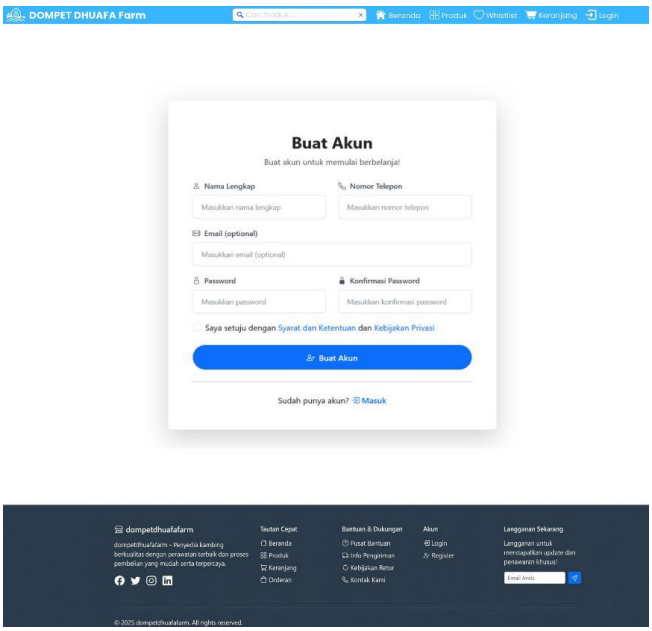


Figure 3. Registration page.

3.2. Login Page

Registration page allowed users to create a new account before accessing the system. The form contains fields for name, telephone number, email, password, and password confirmation. A Create Account button submitted the registration data, while a Login link redirected existing users to the authentication page (see Figure 4).

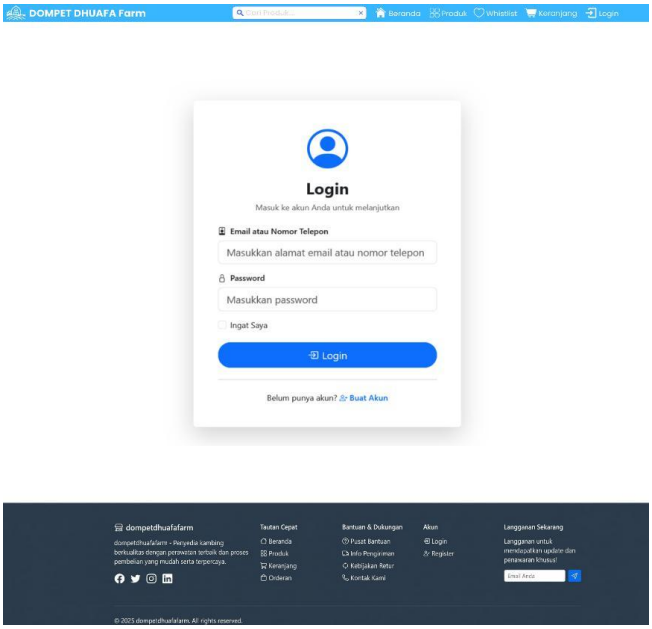


Figure 4. Login page.

3.3. Product Page

The product page displays a structured catalog with the Dompet Dhuafa Farm logo, search field, and navigation menus for Home, Products, Wishlist, Cart, and the user account (see Figure 5 and Table 3). A product filter panel enabled users to filter products by keyword, category, price range, and status such as Featured or Discounted. Product cards presented photographs, labels, product names, short descriptions, normal and discounted prices, stock information, and Add to Cart buttons. The lay-out was designed to help users compare products and make purchasing decisions.

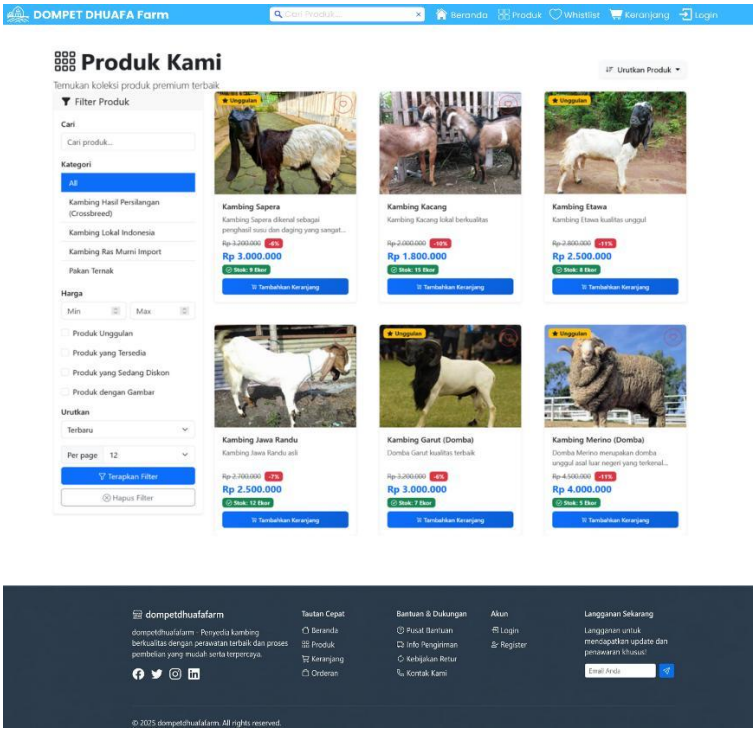


Figure 5. Product page.

Table 3. Goat specification.

User	Task	System requirement
Sapera goat	Approximately 48 kg (adult weight)	While with brown or black patches; medium-sized body with dairy-type characteristics
Kacang goat	Approximately 19 – 22 kg; shoulder height 51 – 52 cm	Black, brown, white, or mixed colors; compact body with relatively short legs
Etawa goat	Approximately 41 – 54 kg; shoulder height 75 – 87 cm	White with black or brown patches; large body with long, drooping ears
Jawa Randu goat	Average body weight: Approximately 26 kg	Commonly brown, black, or white; Medium-sized body with long, drooping ears
Garut sheep	Average body weight: Approximately 30 – 64 kg; shoulder height varies by sex and breeding type	Coat colors include white, black, and mixed patterns
Marino sheep	Adult weight: Approximately 45 – 104 kg; shoulder height: 66 – 81 cm	Predominantly white, with dense, fine wool covering the body

3.4. Shopping Cart

Shopping cart page summarized selected items and displayed product names, unit prices, quantities, totals, and remove controls (see Figure 6). The order summary panel shows subtotal, tax, shipping cost, total payment, and a coupon-code field. Users can proceed to checkout or continue shopping, providing a flexible and intuitive purchasing flow.

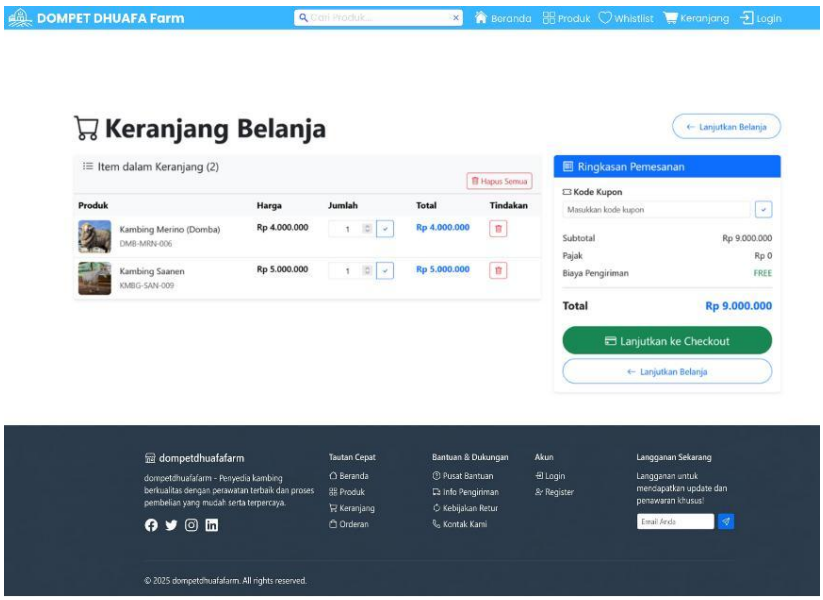


Figure 6. Shopping cart.

3.5. Checkout Page

Checkout page organizes the ordering process into Shipping Information, Payment Method, and Order Summary (see Figure 7). Users can select a saved address or add a new address containing identity, contact, and location details. Payment options include BRI bank transfer, QRIS, and cash on delivery (COD), together with payment instructions and a facility for uploading payment evidence. The Order Summary displayed item details, subtotal, and total payment, while the Place Order button completed the transaction.

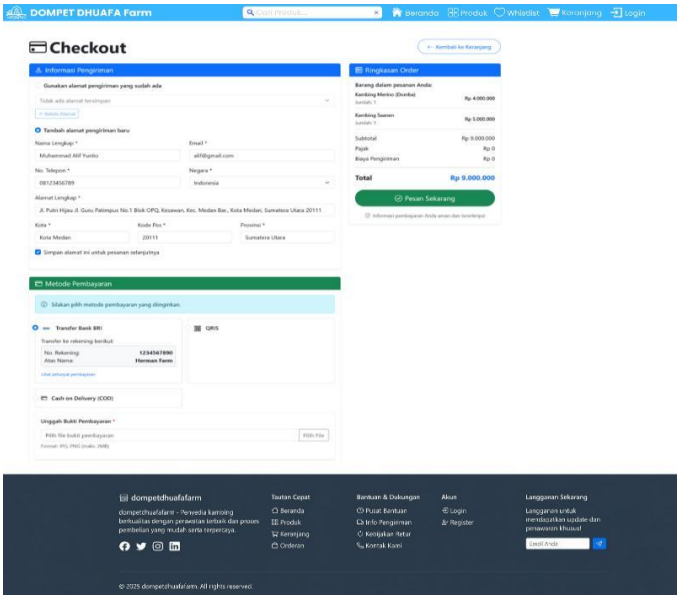


Figure 7. Checkout page.

3.6. Order Detail Page

Order detail page provided centralized order monitoring. It displays the order number and Invoice and Print/PDF controls (see Figure 8). The Order Items table presents products, SKUs, quantities, prices, and totals. An order summary shows the subtotal and final total, while order-status labels such as Pending, Awaiting Verification, and Not Shipped indicate the progress of an order. Payment evidence and shipping information were also presented so that customers could monitor their orders transparently.

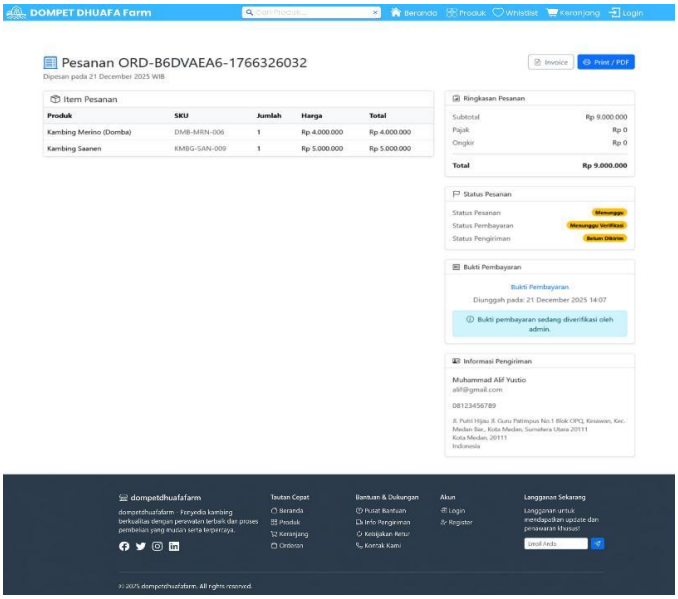


Figure 8. Order details page.

3.7. Admin Dashboard

Admin dashboard contains a left-side navigation panel for Dashboard, Categories, Products, Orders, Users, Settings, Coupons, and Reviews (see Figure 9). The main area summarized the number of orders, products, categories, customers, and total revenue in Indonesian Rupiah. A line chart visualizes sales and revenue trends over the previous 14 days, while the latest-orders table supported monitoring of recent transactions.

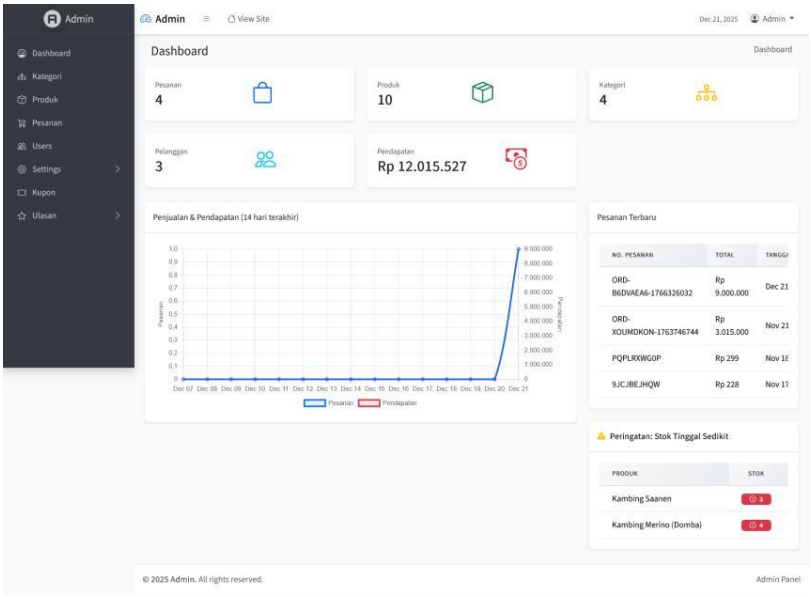


Figure 9. Administrative dashboard interfaces.

3.8. Test Results

After a series of tests were conducted on the web-based goat farm sales information system, the following results were obtained: system operated stably on laptop devices used by the administrator and farm owner, as well as on customer devices for online goat ordering. The main functions, including registration, login, ordering, payment, product management, and order management, operated according to the design developed through RAD. system managed goat sales and stock data in an integrated and real-time manner, including transaction recording, order-status updates, and product and category management by the administrator. Input, processing, and database storage operated properly, with no significant errors identified during testing.

In terms of online marketing, the website provides Dompet Dhuafa Farm with a digital platform to present and promote its goat products to potential customers. The product catalog displays relevant information, including product images, descriptions, prices, and stock availability, allowing visitors to explore and compare available products before making a purchase decision. Furthermore, the search and filtering features enable customers to find products based on specific keywords, categories, price ranges, and product status. The integration of shopping cart, checkout, and order management functions also provides a more structured purchasing process, from product selection to order submission. These features offer potential benefits by improving product accessibility, simplifying customer interactions, and reducing the limitations of conventional marketing methods that depend on direct communication. Therefore, the website can serve as an additional marketing channel to expand the potential customer reach of Dompet Dhuafa Farm and support its online sales activities.

4. CONCLUSION

Web based goat farm sales information system developed using the Rapid Application Development method was successfully implemented and operated according to the requirements of customers, administrators, and the farm owner. The system integrated goat data, sales transactions, and order-status management in a structured manner.

Application of RAD supported the development process by enabling active user involvement throughout the design and development stages. This iterative approach helped align the resulting system with the operational requirements of Dompet Dhuafa Farm and supported relatively rapid implementation.

Developed system improved the management of sales operations by computerizing transaction recording and goat stock management. Compared with the previous manual process, the system provided faster access to sales and inventory information and supported more structured operational management.

AUTHOR CONTRIBUTIONS

Muhammad Khaibar Putra Adithia: Investigation, requirements analysis, data collection and curation, software development, system implementation, visualization, and writing—original draft. Junaidi Junaidi: Conceptualization, methodology, research supervision, interpretation of findings, and writing—review and editing. Ade Nursyarif Tambunan: System design review, validation, functional evaluation, assessment of system requirements, and writing—review and editing. All authors contributed to discussing the findings, revising the manuscript, and approving the final version.

FUNDING STATEMENT

This research received no external funding.

DECLARATION OF AI USE

The authors declare that no AI tools were used in preparing this manuscript.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

All data supporting this study are included in the article. No separate datasets are available.

ETHICAL APPROVAL

Ethical approval was unnecessary, as no humans or animals were involved.

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