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Design of an MSME Information System for Via Fresh Vegetables using the Unified Process Method

Satria[1*], Ikka Novia Wijayanti[2]
[1,2] Information Systems Study Program, Faculty of Information and Digital Technology, Universitas Bani Saleh
*Email: satria@ubs.ac.id

Abstract

Technology plays a crucial role in facilitating human activities, including in the agribusiness sector. Vegetables, as a primary food commodity, require a fast and accurate sales system to meet consumer demands. The Via Fresh Vegetables store still applies conventional sales methods, resulting in suboptimal sales management and customer service. The purpose of this study is to develop a web-based online vegetable sales information system that can assist the store in improving operational efficiency, information accuracy, and expanding its marketing reach. This study uses the Unified Process method, which applies iterative and incremental stages to understand requirements, design, build, and test the system repeatedly. This approach was chosen because it can produce a system that better meets user needs. The result of this research is a web-based sales information system that provides features such as product management, online ordering, transaction history, and customer management. The developed system can help Via Fresh Vegetables improve the effectiveness of its sales process, accelerate services, and provide more accurate information access for customers.

Keywords: Online Vegetable Sales, Information Systems, MSMEs, Unified Process

INTRODUCTION

The development of information technology over the past five years has continued to drive digital transformation in various sectors, including the food and agribusiness sectors that require more efficient, faster, and easily accessible business processes. Web-based digital commerce has become a fundamental necessity for MSMEs to improve competitiveness, efficiency, and service quality. This is in line with the findings of Marlina Sari (2025), who explained that web-based information systems can optimize sales processes and improve operational data accuracy.

In the context of vegetable and agricultural product trading, e-commerce technology has become an important medium for expanding market reach and facilitating interactions between sellers and consumers. Research conducted by Trisna (2025) shows that marketing vegetables through e-commerce platforms in Bali has proven to increase the effectiveness of vegetable distribution and sales. Similarly, Priyadi (2020) in his research on agribusiness MSMEs in Bandungan emphasized that web and mobile-based e-commerce platforms can help business actors expand their customer networks and improve service professionalism.

MSMEs are the sector that most requires the adoption of digital systems to improve business efficiency. Hasan (2025), in his research on MSME marketplaces, found that web-based e-commerce systems significantly contribute to improving transaction management and product information distribution. Similar research conducted by Wahyudi (2023) on MSMEs in Lampung concluded that web-based sales information systems are capable of overcoming various manual problems, such as irregular transaction recording and errors in revenue calculations.

E-commerce has also been proven to directly impact the increase in MSME income. Research by Cahyani (2023) shows that the utilization of e-commerce in culinary MSMEs can significantly increase sales and expand marketing reach. Furthermore, research by Rahmawati (2024) regarding MSMEs in Padang Pariaman explains that properly designed e-commerce systems can help small businesses improve product visibility and enhance sales management systems.

The implementation model of e-shop for MSMEs was also discussed by Arfandi (2024), who developed an OpenCart-based e-shop system for plant sales. The results showed improvements in service quality and transaction efficiency. In a more relevant scope, research by Sinta (2025) regarding web-based vegetable and

grocery ordering shows that digitalizing the ordering process makes transactions faster and more coordinated without recording errors commonly found in conventional methods.

The strengthening of digitalization in food MSMEs is also evident in research by Lubis (2024), who developed a web-based stock and sales report information system for a rice store. The results showed significant improvements in operational effectiveness.

Based on these conditions, Via Fresh Vegetables MSME, which sells fresh vegetables and still uses conventional methods such as ordering through WhatsApp, manual recording using paper receipts, and manual income calculations, faces problems similar to those found in previous studies. The use of text messages for ordering often causes input errors, communication delays, and difficulties in monitoring sales history and stock availability.

This condition indicates the need for a web-based information system capable of automatically and integratively managing orders, stock, transactions, and reports.

The system development uses the Unified Process method, which is known as an iterative and incremental approach to producing systems that meet user needs through continuous refinement. This approach supports deeper requirement understanding and flexibility during the development process.

By implementing a web-based online vegetable sales information system, Via Fresh Vegetables is expected to improve operational efficiency, reduce recording errors, expand marketing reach, and provide better services to customers..

LITERATURE REVIEW

In this literature review, the authors refer to several journal publications related to the system design being developed. Research conducted by Riski Annisa and Arvin Hidayat Waluya (2021) produced a website-based online media that improves efficiency, allows customers to shop anytime and anywhere, and assists both small and large vegetable entrepreneurs in selling their products.

Research by Imam Wahyudi et al. (2023) explains that rapid technological development and increasing economic growth greatly influence the use of technology in business activities. Technological advancements help businesses operate more effectively. For example, Fresh Vegetable Stores have begun implementing technology through web-based applications to conduct transactions for buying and selling fresh fruits and vegetables. These transactions can be carried out digitally using smartphones, making it easier for consumers, especially fruit and vegetable enthusiasts (vegetarians), to obtain the products they like and have them delivered directly to their destination so they can be consumed immediately.

In addition, research conducted by Imam Fauzy Muldani Rachmat (2022) found that sales transactions at Ilham Banjar Store were still conducted using conventional methods, where customers had to visit the store directly and all sales transactions were recorded manually in traditional bookkeeping. To generate reports, the data had to be transferred into spreadsheet programs, and customers had to queue when many buyers were present. Promotions carried out by Ilham Store used brochures, which resulted in paper waste. Therefore, the purpose of the study was to design a mobile commerce application to facilitate users in conducting transactions. The system development method used in the research was RUP (Rational Unified Process), which consists of the phases of Inception, Elaboration, Construction, and Transition. The system modeling used UML diagrams, and the application was developed using the Flutter programming language, PHP, and MySQL for database management. The output of the study produced a mobile commerce application with features such as login, registration, profile editing, cashier management, sales reports, product recommendations, order processing, order confirmation, voucher management, voucher claim handling, transaction cancellation, and payment proof uploads. Application testing used the black box testing method, and the overall results were declared valid.

Meanwhile, research by Vika and Christian Cahyaningtyas (2023) shows that vegetable traders consider their current sales methods to be ineffective. Often, the vegetables they sell remain unsold, become wilted, and are eventually wasted. The payment process still uses cash, and calculating change for customers is typically done using a calculator. If change is unavailable, the money must be exchanged with other traders to obtain smaller denominations. This situation encouraged the authors to design a system that can be used by vegetable sellers. The

proposed solution is to develop a web-based vegetable sales system. This system allows the sales process to become easier and helps business owners monitor sales performance so that transactions can be managed more effectively.

Currently, the sales business is strongly influenced by online sales platforms, which enable easier product marketing and sales. Limited marketing reach and ineffective product promotion may result in businesses failing to achieve maximum profit. When a business or store does not manage its data properly, customers may have to wait too long to purchase available products (Wynna Agusfina, 2023). The final result shows that the website can make it easier for customers to find product information online. This website-based sales application provides a positive impact because it helps buyers save time and assists stores in expanding their online-based sales markets.

Based on several previous studies, it can be concluded that the utilization of information technology in vegetable sales has been widely implemented to improve transaction efficiency and expand marketing reach. However, although these studies have developed digital-based sales systems, most of them still focus on creating applications or transaction media in general and have not specifically implemented sales information systems tailored to the operational needs of specific vegetable-selling MSMEs.

Therefore, this research introduces novelty by designing and implementing a web-based Vegetable Sales Information System for the Via Fresh Vegetables MSME, which not only functions as a transaction medium but also supports product data management, sales transaction processing, and the presentation of sales information in a more structured manner that is easy for business owners to use. The developed system is expected to improve the efficiency of sales management and assist business owners in monitoring sales activities more effectively.

METHOD

This study uses the Unified Process (UP) system development method, which is a software development approach that is iterative, incremental, and object-oriented. The Unified Process was selected because it can clearly define system requirements, minimize risks, and produce a system that can be developed gradually until it achieves optimal quality (Sommerville, 2021).

The Unified Process applies use case–driven, architecture-centric, and iterative development approaches, so that each development stage is carried out repeatedly based on the priority of user requirements and the established system architecture. In this study, the UP method was used to design and develop a web-based Via Fresh Vegetables Sales Information System.

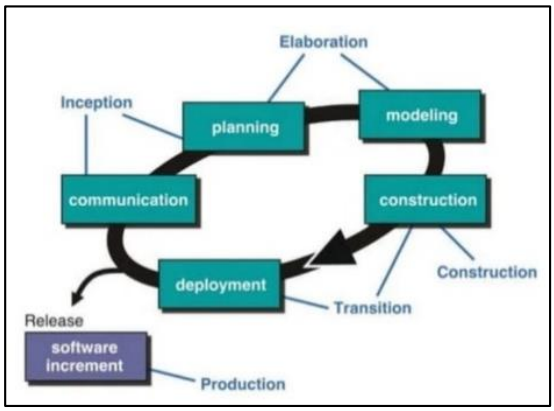

Figure 1. Unified Process Model
(Source: Pressman, 2015)

The main stages of the Unified Process used in this research include the following:

1. Communication is the process of gathering requirements from users or business owners. At this stage, activities such as interviews, observations, and problem analysis are conducted to understand the actual business needs. The objective of this stage is to identify the required features, the constraints faced, and the scope of the system to be developed, resulting in an initial requirements document.
2. Planning, In this stage, the collected requirements are analyzed and formulated into a development plan. Activities include preparing a development schedule, task allocation, risk identification, feature prioritization, and estimation of time and resources needed. The planning stage serves as the foundation for directing the development process so that it runs in a structured manner and achieves the predetermined targets.
3. Modeling is the process of designing the system based on the collected requirements. At this stage, system models are created using several diagrams such as Use Case Diagrams to illustrate user interactions with the system, Activity Diagrams to describe

workflow processes, Class Diagrams to represent data structures, and Sequence Diagrams to illustrate system logic flows. The objective of this stage is to produce a visual representation of the system architecture before entering the implementation phase.

4. Construction is the process of building the software based on the previously designed system. This stage includes coding, interface design, database implementation, and integration between modules. It also involves testing processes such as unit testing and integration testing to ensure that each feature functions properly. The construction stage produces the initial version of the system that is ready for further testing.
5. Deployment is the stage where the system is implemented in a real environment. Activities at this stage include system installation, server configuration, and conducting User Acceptance Testing (UAT) to ensure that the system runs properly and meets user requirements. Users are also given the opportunity to provide feedback regarding features that may still need improvement or adjustment.
6. Software increment is the process of improving and refining the system based on evaluation results and user feedback. This stage includes bug fixing, system performance improvement, and the addition of new features when necessary. This stage ensures that the system continues to evolve and can be used optimally in the long term.

RESULTS AND DISCUSSION

In this study, the system development was carried out using the Unified Process (UP) method, which consists of four main phases: Inception, Elaboration, Construction, and Transition. Each phase produces different deliverables that complement one another, resulting in a system that meets user requirements. The research results obtained in each phase are explained as shown in Figure 2. The Use Case diagram functions to identify the activities that can be performed in the system and the actors who perform those activities.

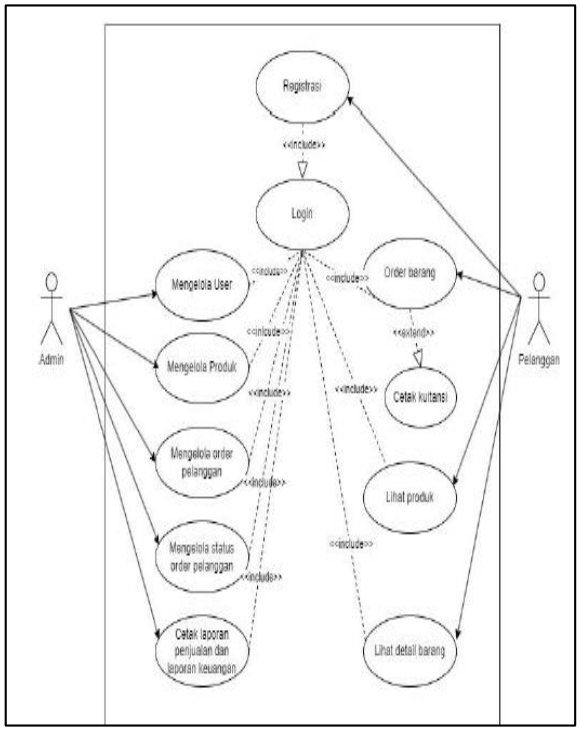

Figure 2. Use Case Diagram

The results of the design of the Via Fresh Vegetables MSME Information System, which was developed using the Unified Process method, are presented through the system interface produced during the implementation stage. The discussion focuses on explaining the system interface as a direct representation of fulfilling user requirements that were identified in the previous phases. Each interface display is analyzed based on its function, information structure, and user interaction flow to ensure that the system design provides an easy, clear, and efficient user experience.

In addition, the presentation of the interface is also an important part of demonstrating how the system integrates the business processes of the Via Fresh Vegetables MSME, starting from ordering, product data management, to generating sales reports. Therefore, this discussion not only describes the visual results of the system design but also evaluates how well the interface design meets usability principles and supports improvements in the overall operational performance of the MSME.

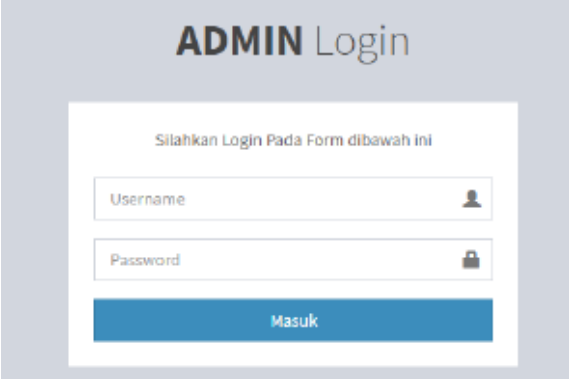

Figure 3. Admin Login Page

The login page is the initial page that must be accessed by the administrator before performing any activities within the system.

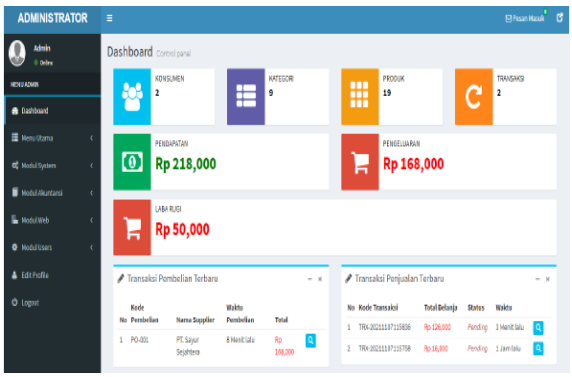

Figure 4. Admin Dashboard

After a successful login, the administrator will be directed to the dashboard page. The dashboard serves as the main page that displays a summary of information through widgets.

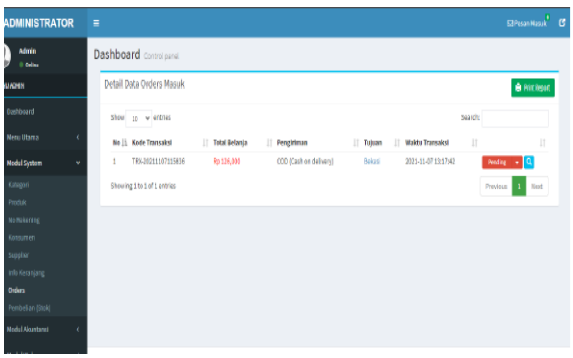

Figure 5. Order Transaction Detail (Sales)

On this transaction detail page, the administrator can view incoming customer transactions and update the order status according to the conditions during packaging and delivery.

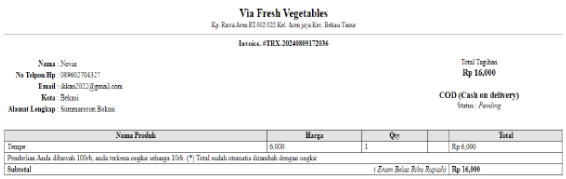

Figure 6. Order Transaction Receipt

After completing a transaction, customers can print a receipt or purchase invoice as proof of the transaction.

Figure 7. Journal Report Display

The report presented in the system is in the form of a general journal. This financial report can be managed by the administrator to record both income and expenditure.

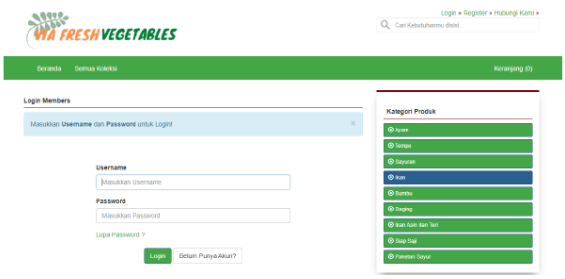

Figure 8. Customer Login Page

Before accessing the system, customers are required to log in first.

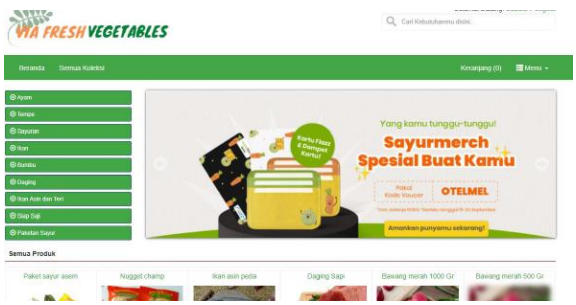

Figure 9. Customer Dashboard

After a successful login, customers will be directed to the dashboard page. The dashboard functions as the main page that displays a summary of information through widgets.

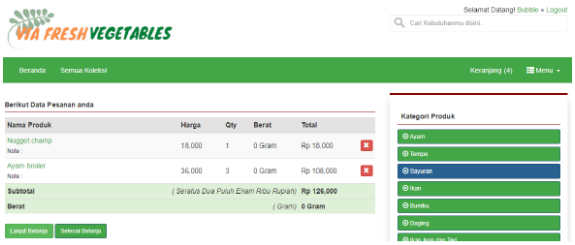

Figure 10. Order Data Display

After viewing the product details, the next page displayed is the order data page, which contains the selected items along with their respective prices.

Thus, this section provides a comprehensive overview of how the interface design supports the main objective of the system, namely assisting Via Fresh Vegetables in managing data, accelerating service processes, and improving the quality of information provided to customers.

CONCLUSION

Based on the analysis of the existing problems and the implementation of the web-based Vegetable Sales Information System for the Via Fresh Vegetables MSME, it can be concluded that the designed system is able to assist business owners in managing the sales process in a more practical, structured, and attractive manner through a formal and user-friendly interface design. The system also simplifies the management of product data, sales transactions, and information presentation more efficiently compared to manual methods.

For future development, this system can be enhanced by adding features such as online payment integration, delivery service integration, and the development of a mobile-based application to allow more flexible access for users. Furthermore, future research can include sales analysis features to assist business owners in making more accurate business decisions. In addition, sales data management becomes more effective and efficient because all information is stored in a computerized system, which minimizes errors in recording orders and generating sales reports. On the other hand, the existence of this web-based system also provides convenience for customers to conduct purchasing transactions without having to visit the store directly, making the ordering process faster and more flexible while improving the service quality of the MSME for its customers.

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