Web-based Palm Oil Seedling Sales Information System (Case Study: CV. XYZ)

Siska Ramadhani[1*], Volvo Sihombing[2], Gomal Juni Yanris[3]

[1,2,3] Faculty of Science and Technology, Universitas Labuhanbatu, Sumatera Utara Indonesia.
[*]Corresponding Author:
Email: siskaramadhania645@gmail.com

Abstract.

Oil palm seedling sales are one of the important aspects of the agricultural industry in Indonesia. However, conventional sales processes often encounter various obstacles, such as limited access to information for consumers, difficulties in inventory management, and low operational efficiency. To overcome these problems, this study aims to develop a Web-based Oil Palm Seedling Sales Information System at CV. XYZ. We designed this system to offer a comprehensive solution for sales management, encompassing stock recording and real-time transaction processing. This study uses a system development method with the waterfall method, in which the development stages include requirements, system design, implementation, verification, and maintenance. We collected data through direct observation at CV XYZ, interviews with management and customers, and related literature studies. Users then tested the prototype to identify potential problems and gather feedback for system improvement. According to the study's findings, the implementation of this web-based information system has resulted in increased efficiency in sales and inventory management. Users can easily access product information, place orders, and track the status of their orders. In addition, this system also allows integration with payment gateways, so that the transaction process becomes faster and safer. This system simplifies customer data management, sales recording, and financial report analysis from a management standpoint. At CV. XYZ, the development of the Web-based Palm Oil Seedling Sales Information System positively impacted operational efficiency and effectiveness. This system not only increases customer satisfaction by providing faster and more transparent services, but it also helps management make more accurate decisions based on available data. We need to add more advanced data analysis features to forecast sales trends and market demands, and integrate the system with e-commerce platforms to broaden our market reach.

Keywords: *Information System, Palm Oil, Sales, Waterfall,and Web.*

I. INTRODUCTION

Due to its ability to produce vegetable oil, which the industrial sector widely needs, palm oil is one of the plantation commodities that plays a significant role in economic activities in Indonesia [1]. You can use palm oil for a variety of purposes, including cooking oil, industrial oil, or fuel (biodiesel) [2]. This is because of its high-pressure oxidation resistance, high coating power, and ability to dissolve chemicals that are insoluble in other solvents [3]. The palm oil industry in Indonesia has become a significant economic sector. According to data from the Ministry of Agriculture, in 2022, the area of oil palm plantations in Indonesia reached 15.38 million hectares [4]. This shows the palm oil industry's great potential and role in the national economy. The oil palm seedling sales business is one of the sectors that plays an important role in the plantation industry in Indonesia. The availability of quality seeds is one important factor in the oil palm industry. Good and superior oil palm seeds are the key to success in oil palm cultivation. The quality of superior seeds can affect the productivity and quality of the oil palm fruit produced. Therefore, the availability of quality oil palm seeds is a key factor for the success of oil palm plantation businesses. Along with the increasing demand for palm oil, the need for superior seeds also increases [5]. However, the process of providing and selling oil palm seeds still faces several challenges, such as limited information, difficulty in access, and minimal price transparency.

These problems can impact the efficiency and effectiveness of the oil palm seedling supply chain. One of the challenges faced by oil palm industry players is the oil palm seedling sales process, which is still not efficient and digitalized. To overcome this problem, a web-based oil palm seedling sales information

system is needed that can facilitate the process of ordering, paying, and monitoring the availability of seeds. CV. XYZ is one of the companies that produces and sells oil palm seedlings in North Labuhanbatu Regency, North Sumatra Province. Currently, CV. XYZ operates its business using a manual sales system, requiring customers to physically visit the company's location or contact them over the phone to place an order for oil palm seedlings. Then, the administrative staff will record the order in Microsoft Excel and check the stock. After that, the administrative staff will prepare the order and make the delivery. We carry out the payment process in cash or through a bank transfer. Furthermore, the administrative staff will record the sales transaction in Microsoft Excel and make a periodic sales report. Manually recording orders, managing stock, and creating reports can lead to errors, delays in information delivery, and challenges in accessing sales data. This is certainly less efficient and can hinder the growth of the company's business. Therefore, the company needs a web-based sales information system to streamline the process of selling oil palm seedlings and expand its market reach.An information system is a system of interrelated components that collect, process, store, and distribute information to support decision-making and supervision in an organization [6].

An information system is a collection of components that work together to form a system with relationships between them and the purpose of producing information on a specific subject [7]. An information system is a data processing activity consisting of collecting, processing, analyzing, and storing data. Then, for the sake of progress and the interests of individuals or organizations, information that has been filtered from the previous process is distributed [8]. The information system streamlines the workflow, leading to a decrease in data entry errors. This system's results demonstrate that organizations can process and check production and stock information more quickly and accurately [9]. Information systems can enhance the efficiency and effectiveness of business processes and aid in strategic decision-making within a business context. A sales information system, for example, can help companies manage sales data, monitor sales trends, and make more accurate sales forecasts [10].Companies can implement a web-based sales information system as a strategy to enhance their competitiveness and broaden their market reach. This system allows customers to order and purchase products online, as well as providing wider access to product and service information [11]. Web applications have several advantages, such as being accessible from various devices, simple to manage, and being able to integrate with databases [12]. In designing and implementing a web-based sales information system, companies need to consider various aspects, such as user needs, required features, data security, and integration with other systems owned by the company [13]. In addition, companies must ensure that the system developed can provide customers with a pleasant experience and increase their satisfaction.

A web-based sales information system assists and facilitates the process of buying and selling palm oil by providing information that is fast, easy to understand, accurate, and real-time [14]. A web-based information system can reduce time and distance by providing more accurate data and better price information, which helps farmers increase their income and welfare due to a more accurate and transparent transaction process [15]. We must develop a problem-handling system to enhance marketing strategies, enabling shop owners to operate calmly and safely, and ensuring the smooth operation of all sales, marketing, and control processes. This will definitely have a positive impact on the main goal of marketing, which is to increase profits [16].The development of a web-based information system is essential to improve efficiency, effectiveness, and sales reach in the oil palm seedling sales business. Therefore, this study aims to design and implement a web-based oil palm seedling sales information system at CV. XYZ. The formulation of the problem is: how to design and build a web-based oil palm seedling sales information system at CV. XYZ, how to implement a web-based oil palm seedling sales information system at CV. XYZ, and how to evaluate the performance of a web-based oil palm seedling sales information system at CV. XYZ. We anticipate that this study will significantly contribute to the development of a web-based oil palm seedling sales information system at CV. XYZ. We expect the developed system to effectively improve sales performance and expand market reach by utilizing appropriate web technology, considering user needs, and integrating with other systems.

II. METHODS

We conducted this research at CV. XYZ, located in North Labuhanbatu Regency, North Sumatra. The research period spanned six months, specifically from January to June 2024. The research focused on the oil palm seedling sales system at CV XYZ. Data collection techniques used in this study were interviews, observations, and documentation studies. We conducted interviews with management and employees to gather information about the oil palm seedling sales business process. We directly observed the oil palm seedling sales process. We conducted documentation studies by collecting and examining documents related to the sale of oil palm seedlings. In developing an information system, this study used the sequential waterfall method, which consists of five stages: system needs analysis, design, implementation, testing, and maintenance [17], [18]. Figure 1 shows the waterfall method's stages.

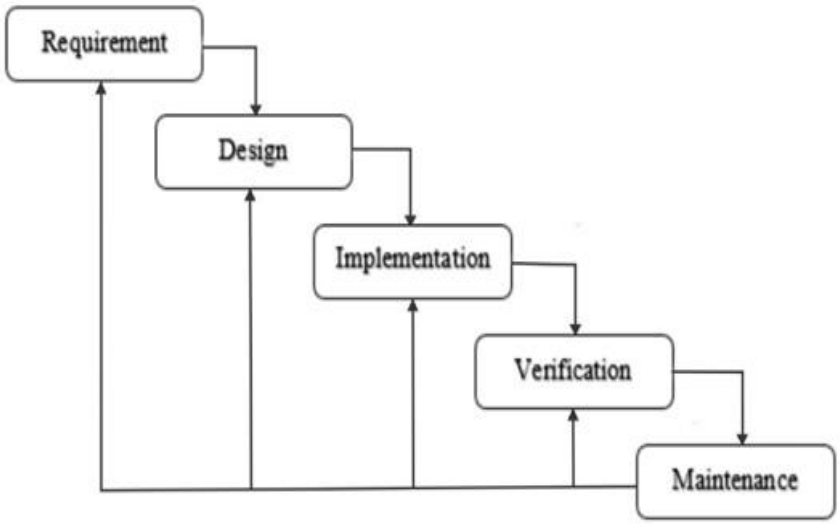

Fig 1. Waterfall Method

During the requirement stage, we conduct a needs analysis of the system under design. The method is to understand the running system to identify existing problems and understand the existing business processes, and after that, a system needs analysis can be carried out to determine the needs of the system to be designed, both functional and non-functional needs. We base our system design on the results of the needs analysis. We use the unified modeling language to design the system. A mockup design is used for the interface design. During the implementation phase, the PHP programming language creates the program code, while the MySQL DBMS handles the database. During the verification stage, we conduct testing on the constructed system. Testing uses the Blackbox Testing method. The created system undergoes maintenance at this stage. We will make repairs if there are functions we haven't seen before. For further system maintenance.

III. RESULT AND DISCUSSION

Based on the analysis of the current system, CV XYZ is facing several problems. These include: the manual process of recording orders, managing stock, and creating reports using Microsoft Excel, which is prone to errors and delays; customers must physically visit the office or contact via telephone to place orders, which is less efficient; and customers cannot access information related to products, stock, and order status in real-time. For this reason, CV XYZ requires a web-based oil palm seedling sales information system that can: record and manage order data, stock, and sales transactions in a computerized manner; provide a product catalog, facilitate online ordering, and provide order status information; and generate sales reports automatically and in real-time.

Fig 2. Use Case Diagram

Figure 2 shows the use case diagram for CV. XYZ's oil palm seedling sales information system. There are two actors in this system, namely farmers and administrators. Use cases depict the functionality or actions available within the system. The line between the actor and the use case shows the interaction, or who can perform a particular action. Farmers can register an account to be able to order seeds. Farmers can view the available seedling catalog, which includes detailed information. Farmers can order the selected seeds and determine the number of orders. Farmers can pay using the available payment methods. The administrator has the ability to manage seedling data, which includes the ability to add, change, or delete seedling data.

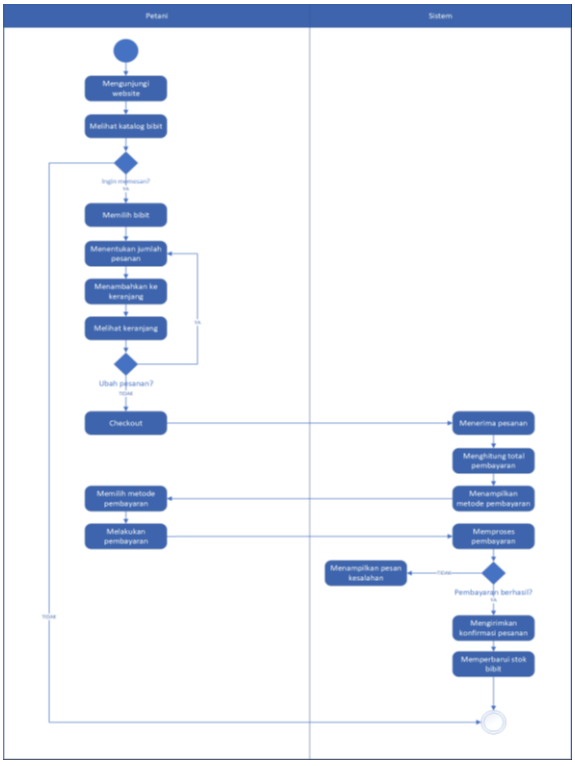

Fig 3. Activity Diagram

Figure 3 shows an activity diagram of CV. XYZ's oil palm seedling sales information system. Farmers visit the website and browse the seedling catalog. Farmers can choose to order seedlings or check out. When ordering, farmers select seedlings, determine their quantity, and add them to the cart. Before checking out, farmers can view and change the cart. At checkout, the system calculates the total payment and displays the payment method. Farmers select a payment method and make the payment. The system processes the payment. If the payment is successful, the system sends a confirmation and updates the seedling stock. If the payment fails, the system displays an error message.

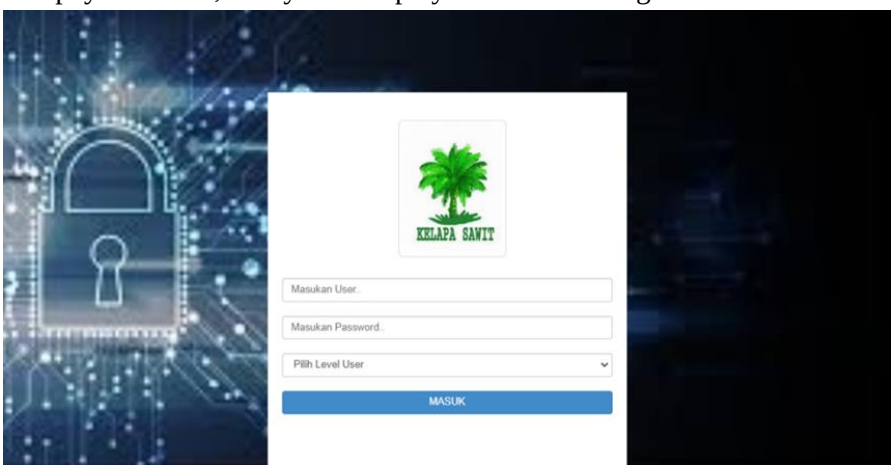

Fig 4. Login display for oil palm seedling sales information system

Figure 4 shows the login page display of the Web-based Oil Palm Seedling Sales Information System at CV. XYZ. This login page is the initial interface for users to access the information system. The image shows a background with a padlock illustration that implies security and data protection. The simple yet effective design of this user interface emphasizes ease of use and security. At the top center, there is a logo with an image of an oil palm and the words "PALM OIL," which represents the system and company's identity (CV. XYZ). This helps users to ensure that they are accessing the correct platform. Enter User: You can enter a registered username or email in this field. The system will use this username as a unique identity to identify each user. Enter Password: The system uses this field to enter an encrypted password before sending it to the server. We use this password as an access key to guarantee that only authorized users can access the system. Select User Level: This is a dropdown menu that allows users to select their access level or role in the system, such as "Admin" and "Farmer." The system sets different access rights and features for each user level based on business needs. The Login Button transmits the user-filled data to the server for the authentication process. If the entered data is correct and valid, the system will redirect the user to either the main page or the dashboard, depending on their selected user level. The use of a padlock symbol in the background indicates a focus on data security. This is a visual element that emphasizes the importance of protecting user information, especially sensitive data such as passwords.

The system uses the HTTPS protocol to encrypt data transmitted between the client and server, preventing unauthorized third parties from accessing it. The “Select User Level” feature indicates that the system has a role-based access rights management mechanism. This is an important feature in an information system, ensuring that only authorized users can access certain information and features. We designed the interface with simplicity in mind, ensuring users can easily understand and use the system without extensive guidance. Users only need to enter their username and password and select their role before accessing the system. The clear design and consistent use of visual elements help ensure that the interface is accessible and usable by a variety of users, including those who may not be very familiar with technology. This login screen is an important part of the Web-based Palm Oil Seedling Sales Information System. This page not only serves as a security gateway to protect access to sensitive data but also plays a role in providing a positive user experience through an intuitive and informative design. Features such as managing access rights based on user level demonstrate attention to proper access control, which is essential for systems with users of various roles.

IV. CONCLUSION

CV. XYZ has successfully designed and built the web-based oil palm seedling sales information system, encompassing system modeling, database design, and interface design. We have successfully implemented the web-based oil palm seedling sales information system, encompassing the implementation environment, interface, and system functionality. The test results show that the web-based oil palm seedling sales information system has run well and is in accordance with user needs. Users (admins and managers) require training for further research to enhance their comprehension and proficiency in using the web-based oil palm seedling sales information system. Further development is needed, such as adding online payment features, integration with logistics systems, and more comprehensive sales data analysis. The web-based oil palm seedling sales information system requires periodic evaluation and maintenance to maintain its performance and security.

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