Journal of Agrocomplex and Engineering

e-ISSN 3109-9955 (online)

Volume 1, Issue 4 2025
Page 160-172

https://doi.org/xxxxxx

Design Application Service E-Commerce Web Based Ornamental Plants

Putri Handayani[1]

[1]Computer Engineering, Ujung Pandang State Polytechnic

ARTICLE INFO

Received: 19 May 2025
Revised: 25 June 2025
Accepted: 20 July 2025
Available online: 28 July 2025

Keywords:
Application
E-Commerce
Plant Decorate
Web

Corresponding Author:
Putri Handayani

Email:
putrihandayani@yahoo.com

ABSTRACT

***Purpose**: The development of the internet today has had a major impact on the progress of various industries. The sales system used in the ornamental plant sales process goods are still manual which are accessed by customers by visiting the location and seeing the product directly. The purpose of this study is to design a web-based ornamental plant e-commerce service application system to facilitate sales and purchase transactions.*

***Subjects and Methods:** The testing method used is the black-box testing method, where the system is executed through trials and checking the functionality of the software.*

***Results:** The results of testing this application are that customers register, so that customers get an account then customers log into the application to choose ornamental plants offered in the application, after finding the desired plant, then fill in the shipping address and type of payment which then forms information with the order status in process.*

***Conclusions:** The conclusion of the testing of the ornamental plant e-commerce application system is that it is in accordance with what customers want in providing easy access to the application practically.*

INTRODUCTION

The development of information technology and the internet in recent decades has brought significant changes to various aspects of human life (Lyytinen & Rose, 2003). This transformation has not only affected the way individuals communicate but has also transformed work patterns, service systems, and decision-making mechanisms in various sectors, including education, government, and the business world. According to Jia & Zhu (2025) the presence of digital technology has become a key factor in driving efficiency and modernizing work systems.

The internet, originally used as a means of communication, has now evolved into a key infrastructure for information management and economic activity. Through the internet, data storage, processing, and distribution can be carried out quickly and accurately (Babar & Arif, 2019; Park et al., 2016). This enables organizations to respond to environmental changes in a more adaptive and data-driven manner, thereby improving the quality of decision-making.

Along with these developments, many organizations and actors are moving away from manual systems and toward technology-based systems. This change is driven by the need to improve operational efficiency, reduce recording errors, and accelerate business processes. Digital systems

enable real-time data updates and eliminate the limitations of space and time in conducting business activities (Subani et al., 2021; Vera-Baquero et al., 2016; Coronado et al., 2018).

In the business context, the use of the internet has given rise to the concept of electronic commerce (e-commerce), one of the most influential innovations in modern commerce (Wu & Hisa, 2008; Kwilinski et al., 2019). E-commerce allows buying and selling processes to be conducted electronically via the internet, eliminating the need for physical meetings between sellers and buyers. This business model offers both convenience and convenience unavailable through conventional systems. The primary advantage of e-commerce lies in its ability to open broader market access.

Through digital platforms, businesses can market products and services to various regions, even across countries, at a relatively lower cost than traditional marketing methods. Furthermore, e-commerce serves as an effective promotional medium by displaying comprehensive and attractive product information (Handayani, 2024). For small and medium enterprises (SMEs), e-commerce plays a strategic role in increasing competitiveness. The limited capital and resources often faced by SMEs can be overcome through the use of digital technology (Arendt, 2008).

With e-commerce, SMEs can expand their market reach, increase product visibility, and build better relationships with customers without requiring significant investment in physical infrastructure. Dia et al. (2023) said that, one business sector with significant potential for development through e-commerce is the ornamental plant business. Increasing public awareness of environmental aesthetics, quality of life, and sustainable lifestyles has driven an increase in demand for ornamental plants.

Ornamental plants are not only used as decorative elements, but also as part of a modern, environmentally friendly lifestyle. However, many ornamental plant businesses still rely on traditional sales systems. Sales models that require customers to come directly to the business location limit market reach and reduce transaction efficiency. Furthermore, manual systems often complicate analysis of sales recording, inventory management, and customer data. In fact, ornamental plant products are highly suitable for online marketing (Man et al., 2023).

Product visualization through attractive photos and descriptions can provide consumers with a clear and structured understanding before making a purchase. With the support of an e-commerce system, information regarding plant types, prices, stock availability, and care can be conveyed clearly and structured. CV. Ary Gazebo, located on Jalan Danau Tanjung Bunga, Makassar City, is a business operating in the ornamental plant sector that plays a vital role in the local economy.

This business contributes to employment and supports regional economic growth. CV. Ary Gazebo's business activities reflect the potential of the ornamental plant sector as a source of livelihood for the community. However, CV. Ary Gazebo still faces various challenges in managing its business. The sales process is still manual, requiring customers to come directly to the location, limiting customer reach. Furthermore, transaction recording and customer data management have not been systematically integrated, impacting management effectiveness and decision-making.

Therefore, the development of a web-based e-commerce service application is an urgent need for CV. Ary Gazebo. This system is expected to integrate marketing processes, transactions, and sales data management into a single, easily accessible platform. Implementing e-commerce will not only improve operational efficiency but also expand markets and strengthen business competitiveness in the digital age.

LITERATURE REVIEW

Design

Design is a critical phase in software development that serves as a bridge between user requirements and technical implementation. The design stage involves planning system architecture, data structures, user interfaces, and process workflows. A well-structured design ensures that the resulting system is user-friendly, scalable, and capable of meeting user needs

effectively. According to Caron et al. (2018), the primary objective of design is to produce a model or representation of the system to be developed, enabling systematic and well-directed implementation.

Application

An application is a software program designed to perform specific tasks according to user needs. According to the Indonesian Dictionary (KBBI), an application is the implementation of a system designed to process data based on certain rules or provisions. In information technology, applications function as tools to enhance productivity and efficiency. Wang & Reani (2017) state that computer applications are developed to assist users in completing particular tasks more quickly and accurately, whether in desktop, web-based, or mobile environments.

Service

Service refers to activities or benefits provided by one party to another to meet specific needs. Services are intangible and do not result in ownership of physical goods. In the context of information systems, service quality is closely related to how effectively a system delivers convenience, reliability, and user satisfaction. According to Grönroos (1998), services can be defined as forms of assistance or facilities provided to customers in accordance with their needs, whether directly or indirectly related to physical products.

E-Commerce

Electronic Commerce (e-commerce) is the process of buying, selling, or exchanging products, services, and information through computer networks, particularly the internet. E-commerce is a component of e-business, which has a broader scope encompassing business partner collaboration, customer service, and business information management (Holsapple & Singh, 2000). According to Kedah (2023), e-commerce requires not only web technology but also supporting technologies such as databases, email systems, logistics networks, and electronic payment mechanisms. The adoption of e-commerce enables businesses to operate more efficiently, transparently, and in an integrated manner.

Web

The web is an internet-based information presentation service that uses hypertext and hyperlink concepts, allowing users to easily access and navigate information through web browsers. Web technology supports the presentation of information in various formats, including text, images, audio, and video. Alwiyah et al. (2019) explains that the web is an effective medium for information dissemination and for providing interactive services to users, particularly in the development of e-commerce applications.

PHP and MySQL

PHP (PHP: Hypertext Preprocessor) is a widely used server-side scripting language for web application development. PHP can be embedded into HTML code and executed on the server to generate dynamic web pages. According to Tazkia (2019), PHP offers advantages such as ease of use, flexibility, and strong community support. MySQL is an open-source database management system commonly used in conjunction with PHP in web application development. It is designed to store, manage, and process structured data efficiently. Ehikioya & Guillemot (2020) states that MySQL provides reliable performance, easy integration, and cross-platform compatibility, making it highly suitable for e-commerce application development.

METHODOLOGY

This study employed the System Development Life Cycle (SDLC) as the primary method for system development. SDLC was selected because it provides a structured and systematic framework for designing, developing, testing, and implementing information systems. The application of this method allows the development process to be carried out in sequential stages, ensuring that each phase is completed and evaluated before proceeding to the next. Through the SDLC approach, this research aims not only to develop an e-commerce application for

ornamental plant sales but also to evaluate the effectiveness and functionality of the system in supporting business processes.

System Development Life Cycle (SDLC)

The SDLC method in this study consists of several main stages: requirements analysis, system design, implementation, testing, and deployment. In the requirements analysis stage, system needs were identified based on observations and interviews with business owners to understand existing problems in the sales and marketing processes. This stage focused on defining functional requirements, such as product management, online transactions, customer data management, and order processing, as well as non-functional requirements related to system usability and performance. The system design stage translated the identified requirements into a structured system architecture. This included database design, interface design, and process flow modeling to ensure that the system would be user-friendly and capable of supporting efficient transactions. During the implementation stage, the system was developed using web-based technologies, integrating the database and application logic to create a functional e-commerce platform. Each module was developed according to the predefined design specifications to minimize errors and ensure consistency.

Tools and Materials

The tools used in this study were divided into hardware and software components. The hardware used consisted of a computer with an Intel® Core™ processor, 4 GB RAM, 1 TB hard disk, and adequate virtual memory to support application development and testing activities. This hardware configuration was sufficient to run the required development tools and server environment smoothly. The software tools included XAMPP as a local web server environment, PHP as the server-side programming language, and MySQL as the database management system. Android Studio was used as the development environment and text editor for system coding and interface design. The operating systems used were Windows 10 Pro 64-bit for development and Android OS (Lollipop) for testing system compatibility on mobile platforms. These tools were selected due to their compatibility, open-source nature, and widespread use in web application development. The materials used in this research consisted of data related to ornamental plant products, including various types such as spider plants, begonias, red shoots, and other ornamental plants. These data were used as sample content for product catalogs, pricing information, and transaction simulations within the e-commerce system.

Testing Method

The system testing phase employed Black Box Testing, which focuses on evaluating the functionality of the software without considering its internal code structure. This testing method was chosen to ensure that each system feature operates according to the specified requirements and user expectations. Testing scenarios were designed based on functional requirements, such as user registration, product browsing, ordering, payment processing, and data management. Through Black Box Testing, the system was evaluated to identify functional errors, interface display issues, and input-output inconsistencies. This testing approach provided an overview of system performance from the user's perspective, ensuring that the application delivers reliable functionality and a user-friendly experience. The results of the testing process were used to refine the system and confirm that the application was ready for deployment and practical use.

RESULTS AND DISCUSSION

Design System

The design stage is the stage of changing requirements that are still in the concept stage. to be specifications system Which ril.

Figure 1. System Design

The image above depicts the workflow of an e-commerce system, demonstrating the interrelationships between the main components in the online sales transaction process. This diagram explains how the interaction between customers, the e-commerce system, payment, inventory management, and shipping occurs in an integrated, continuous cycle. The process begins with customers accessing the e-commerce platform through a digital device. At this stage, customers can view product information, such as item type, price, and stock availability. Next, customers select products by adding the desired items to their shopping cart. This stage represents the initial ordering process, which is completely controlled by the user through the system interface.

After product selection, the system directs the customer to the payment phase (bank payment). In this phase, financial transactions are conducted through banking services or electronic payment systems connected to the e-commerce application. Successful payment is a critical indicator for the system to continue the transaction process, while also ensuring the security and validity of the customer's payment. Once payment is confirmed, order information is forwarded to the warehouse. The warehouse plays a role in preparing goods according to customer orders, including stock checking, packaging, and recording outgoing goods. This stage demonstrates the integration between the sales information system and the inventory management system, thus minimizing errors in product management.

The next stage is shipping, where packaged goods are delivered to customers via logistics services. Shipping information is typically recorded in the system so customers can monitor the order status. Once the goods are received, the transaction cycle returns to the customer, marking the completion of the entire e-commerce process. Overall, this diagram represents a structured and interconnected e-commerce system design, from ordering to delivery. This diagram emphasizes that each component customer, e-commerce system, payment, warehouse, and shipping plays a critical role in creating an efficient, integrated, and user-satisfying transaction process.

Appearance Application

web-based ornamental plant e-commerce service application:

Appearance List Members

Displays the process of becoming a member of the application by filling in several data, starting from full name, username, password, cellphone number and address.

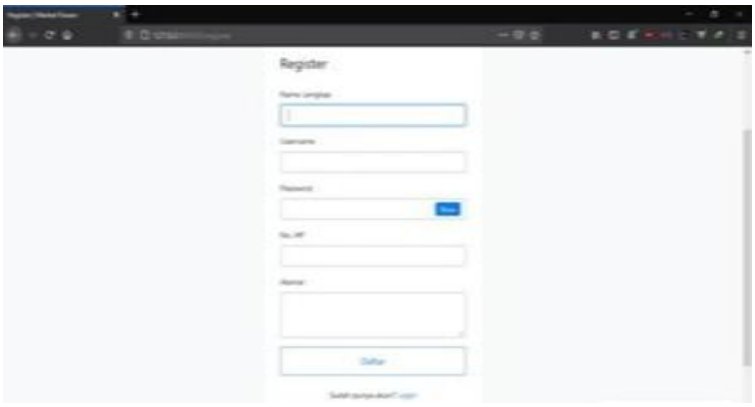

Figure 2. Appearance List Member
Source: Researcher Data, 2021

The image above displays the user interface for the member registration page on a web-based ornamental plant e-commerce service application. This page serves as the entry point for new users who wish to register and gain full access to the application's features. At the top of the page is the heading "Register," indicating that this page is for the new account creation process. The page layout is simple and centered, making it easy for users to understand the data entry process without excessive visual distractions. This minimalist design aims to enhance user comfort and focus during registration.

The registration form consists of several data input fields that must be filled in by prospective members. The Full Name field is used to enter the user's full name as their primary identification. The Username field serves as a unique identifier that users will use when logging into the system. The Password field is equipped with a character masking feature (usually dots or symbols), which aims to maintain data security and prevent others from viewing the password entered. The next field is the Mobile Phone Number (HP) field, which is used as the user's contact information. This data can be used by the system for order confirmation, transaction notifications, or customer service communications. Next, there's the Address field, which allows users to enter their residential or shipping address. This address information is crucial in the context of ornamental plant e-commerce because it directly impacts the product delivery process.

At the bottom of the form, there's a "Submit" button, which sends the completed data to the system. Once clicked, the system processes the registration data, validates it, and saves the user information to the database. If the data is valid, the user will be registered as a member and can proceed to the login stage or directly access the in-app shopping features. Overall, the appearance of this registration page reflects the functional, user-friendly, and user-friendly design of the e-commerce application. The clear and systematic form structure helps expedite the registration process and supports integrated customer data management within the web-based ornamental plant e-commerce system.

Appearance Login Process

Displays the login process for the user.

Figure 3. Appearance Process Login
Source: Researcher Data, 2021

The image above displays the user interface for the login process for a web-based ornamental plant e-commerce service application. This page serves as an authentication mechanism to ensure that only registered users can access the system and use the features available within the application. In the center of the page is a login form, designed in a simple and focused manner, making it easy for users to log in. The application icon or logo is typically displayed at the top of the form, serving as a visual identity and reinforcing the image and consistency of the application's design.

The login form consists of two main input fields: Username and Password. The Username field is used by the user to enter their previously registered account credentials. The Password field is used to enter a confidential password, with characters obscured to maintain data security and prevent unauthorized access. Below the input fields is a "Login" button, the primary control for sending authentication data to the system. Once this button is pressed, the system will perform a verification process by matching the user's entered data with the data stored in the database. If the username and password match, the user will be redirected to the main page or application dashboard. Conversely, if the data is inaccurate, the system can display an error message as feedback to the user.

Additionally, at the bottom of the login form, there is a link or additional text such as "Don't have an account? Register here" (or similar text), which directs new users to the registration page if they don't already have an account. This feature demonstrates the system's design for an integrated registration and login process, making the application's user flow clearer and easier to understand. Overall, the login page's appearance reflects a simple, secure, and user-friendly interface. The concise form structure helps expedite user access, while the authentication mechanism ensures the security of data and transaction activities within the web-based ornamental plant e-commerce application.

Home Page View

Displaying all type ornamental plants and name and price.

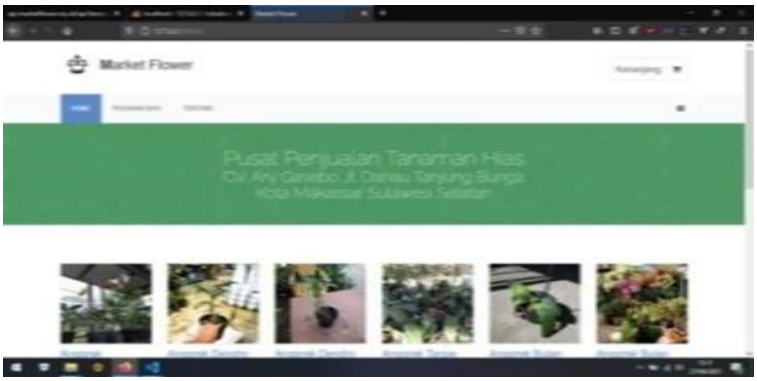

Figure 4. Appearance Menu Home
Source: Researcher Data, 2021

The image above displays the main page (Home Page) of a web-based ornamental plant e-commerce application. This page serves as the first page users access after successfully logging in or opening the website, serving as the primary information center regarding the products offered. At the top of the page, you can see the application header, which displays the system identity or store name, Market Flower. This header also features navigation menus, such as the Home menu, plant categories, and user account options (login/logout), allowing users to navigate between pages quickly and in a structured manner.

In the center of the page is the main banner with a green background. This banner contains brief information about the store, such as the business name, CV. Ary Gazebo, the location (Jalan Tanjung Bunga), and the description that the store is a center for ornamental plant sales. This banner serves as a promotional tool and a brief introduction to the business's identity. Below the main banner, a list of ornamental plant products is displayed in a grid or image gallery format. Each product is presented with a photo of the plant, the name of the plant, and the price, allowing

users to immediately view the variety of available plants without having to open the details page first. This visual presentation is crucial because ornamental plants are a product that relies heavily on visual appeal in the marketing process.

The product listing is neatly organized and responsive, allowing users to scroll down the page to see more plant options. This makes it easy for customers to compare plant types based on appearance and price before deciding to purchase. Overall, the main page is designed to provide an informative and engaging user experience, prioritizing product visuals, ease of navigation, and transparent pricing information. This page plays a crucial role in attracting customer interest, expanding marketing reach, and supporting the effectiveness of ornamental plant sales through a web-based e-commerce system.

Detailed view of selected plant

Displays details of selected plant. For added to the order basket

Figure 5. Appearance Detail Plants
Source: Researcher Data, 2021

The image above shows the product details page on a web-based ornamental plant e-commerce application. This page appears when users select a plant from the main page, providing more complete and specific information about the product they wish to purchase. At the top of the page, the header and store information banner are still visible, displaying the business identity of CV. Ary Gazebo, located on Jalan Tanjung Bunga, Makassar City, South Sulawesi. This banner maintains a consistent appearance and reinforces the store's identity on each page of the application.

The main page displays a larger image of the selected ornamental plant than the one displayed on the main page. In the example image, the plant shown is an Aglaonema Big Roy Besar. This large image allows users to more clearly see the plant's physical details, such as leaf color, shape, and condition, before making a purchase. Next to or below the product image, detailed product information is provided, including the plant name, price, and a brief description. The description section explains the plant's characteristics, helping users understand its advantages and distinctive features. This information is crucial for building customer trust in the product.

Additionally, this page also features action buttons, such as the "Add to Cart" button, which allows users to directly add products to their shopping cart. This feature simplifies the transaction process, eliminating the need for users to return to another page to continue purchasing. Overall, the product detail page is designed to support purchasing decisions by presenting comprehensive information, clear visuals, and easy-to-use ordering features. This page is a crucial part of the e-commerce flow, bridging the product search phase with the subsequent transaction process.

Plant order view

Shows the plant order process with fill in address and type of payment

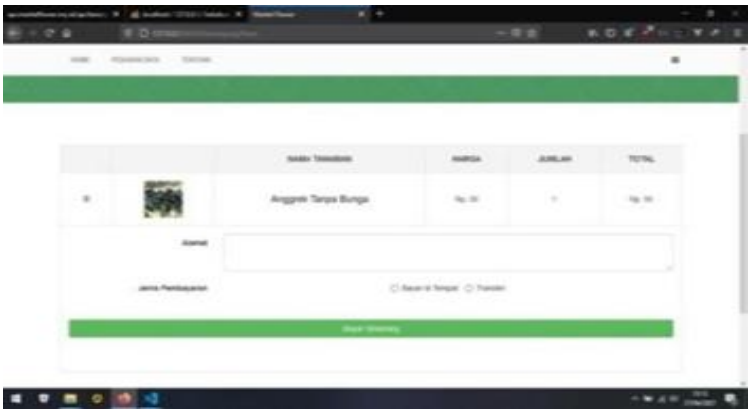

Figure 6. Appearance Order Plants
Source: Researcher Data, 2021

The image above shows the plant order view on a web-based ornamental plant e-commerce application. This page represents the next step after the user selects a product and adds it to the shopping cart. Its function is to confirm the order and complete the required data before the transaction is completed.

At the top of the page, a table displays the order summary. This table contains key information regarding the product ordered, such as the image of the plant, the name of the selected ornamental plant, the unit price, the order quantity, and the total price. This information presentation helps users verify that the product, quantity, and price listed match their wishes before proceeding to payment. Below the order table, there is a shipping address field that users must fill in. This field records the destination address for the plant, so the seller can handle the distribution process accurately. Clear and complete address entry is crucial to avoid shipping errors and ensure the product reaches the customer safely.

Furthermore, this page also provides payment method options. Users can choose from available payment methods, such as cash or bank transfer. These payment method options provide flexibility and adapt to each user's preferences when making a transaction. At the bottom of the page, there is a confirmation or order button to complete the ordering process. Once clicked, the system will process the order based on the input data, including the product ordered, shipping address, and selected payment method. Overall, the ordering page is designed to be simple and structured to easily understand the transaction flow. This page plays a crucial role in ensuring that the ornamental plant ordering process is orderly, accurate, and efficient, while also enhancing user experience while using the e-commerce application.

View

Displays product updates and incoming orders.

Figure 7. Appearance Dashboard
Source: Researcher Data, 2021

The image above displays the "View" page of a web-based ornamental plant e-commerce application, which displays product updates and incoming orders. This page serves as a monitoring interface, making it easier for users especially managers or admins to monitor transaction activity within the system. The main section of the page displays an order information table displaying data on products ordered by customers. The information displayed includes the ornamental plant product image, plant name, unit price, quantity ordered, and the total price. Presenting the data in tabular format makes the information easy to read and helps managers quickly understand the details of each incoming order.

Below the table, there is a description or notes column, which can be used to add additional information related to the order, such as special instructions from the customer, order status, or internal notes for order management and follow-up purposes. This feature supports a more streamlined and organized administrative process. Furthermore, this page also displays the payment method selected by the customer, such as cash or bank transfer. This information is crucial for managers to verify payment before proceeding to the product packaging and shipping stages.

At the bottom of the page, there are action buttons for processing or confirming orders. This button indicates that the order has been received by the system and is ready for further processing, including payment, shipping, and order status updates. Overall, the "View" page is designed to support effective and efficient order management. By presenting order information in a structured and comprehensive manner, this page helps improve the accuracy of transaction data management, expedite the service process, and support better decision-making in ornamental plant e-commerce operations.

Appearance plant input

Before presenting the interface shown in the image below, it is important to understand that this stage represents a crucial part of the system workflow, namely the plant data input process. This process is designed to ensure that information related to plants is entered accurately and systematically into the system. Through this feature, users can record essential plant attributes, manage data efficiently, and support subsequent processes such as monitoring, ordering, and updates. The following image illustrates how the plant input interface is structured to facilitate ease of use, clarity, and consistency in managing plant-related data within the application.

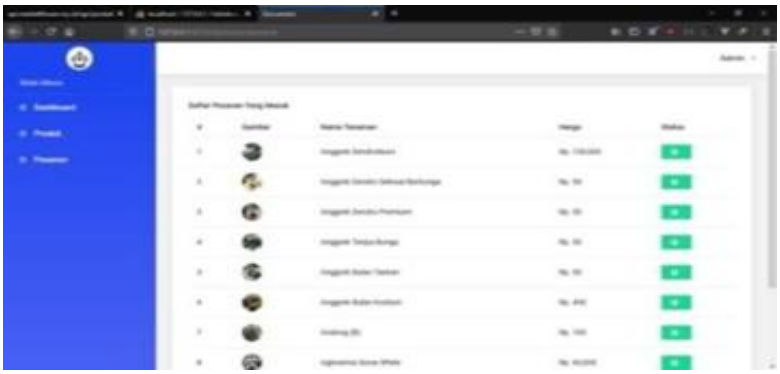

Figure 8. Appearance Input Plants
Source: Researcher Data, 2021

View incoming orders

Before presenting the interface shown in the figure below, it is important to explain that this feature functions as a monitoring and management tool for incoming orders within the system. This interface allows administrators or operators to view all orders submitted by customers in real time, including relevant order details and current status. Through this menu, users can track the order processing flow and perform confirmation actions once the delivery has been completed. The following image illustrates the order entry and confirmation display, which supports efficient order control, accuracy in transaction handling, and timely service delivery.

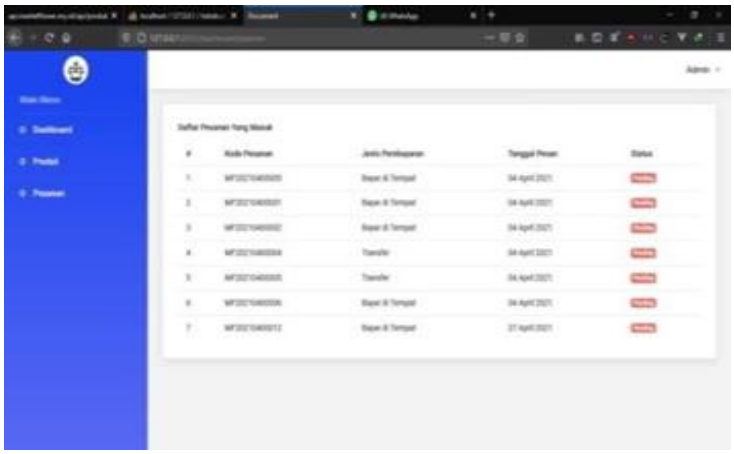

Figure 11. Appearance Order Enter
Source: Researcher Data, 2021

Researcher Previous

According to previous researchers Muhyiddin Zainul Arifin et al, regarding the Design and Construction of Pandukria E-Commerce Based on the Codeigniter Framework, this application is able to accommodate all products. made from pandan duri raw materials from UKM craft products Crafts fostered so it is hoped that it will speed up transactions between craftsmen and buyers (Arifin et al., 2019). According to Sri Haryanti and Tri Irianto, Designing an E-Commerce Information System for Fashion Businesses, this application can help vendors to promote their plant products. decoration to make it easier to manage the e-commerce you have. can also help consumers who want to get information and order products without having to go directly to the store and find out about the latest stock collections and clothing trends without having to contact the vendor via SMS / telephone (Handayani, 2024).

CONCLUSION

Design results in this application, the researcher concluded that after designing a web-based ornamental plant E-Commerce service application, the following conclusions can be drawn: (1) The implementation of this ornamental plant sales application can help shop owners to serve customers optimally by providing information. to customer details and ordering ornamental plants in the application; (2) This application allows shop owners to directly serve requests from; (3) The implementation of this application makes it easier for customers to buy ornamental plants without coming directly to the store and the goods will be delivered to their destination.

REFERENCES

Alwiyah, A., Greisy, C., & Afitri, A. (2019). Implementation Of Information Systems On E-commerce Websites As Media To Deliver Information. *Aptisi Transactions On Technopreneurship (ATT)*, *1*(2), 127-133. https://doi.org/10.34306/att.v1i2.28

Arendt, L. (2008). Barriers to ICT adoption in SMEs: how to bridge the digital divide?. *Journal of systems and information technology*, *10*(2), 93-108. https://doi.org/10.1108/13287260810897738

Arifin, M. Z., Alfaris, H. B. I., Sufaidah, S., & Sifaunajah, A. (2019). Rancang bangun E-commerce pandukria berbasis framework codeigniter. *Saintekbu*, *11*(1), 1-11. https://doi.org/10.32764/saintekbu.v11i1.251

Babar, M., & Arif, F. (2019). Real-time data processing scheme using big data analytics in internet of things based smart transportation environment. *Journal of Ambient Intelligence and Humanized Computing*, *10*(10), 4167-4177. https://doi.org/10.1007/s12652-018-0820-5

Caron, P., Ferrero y de Loma-Osorio, G., Nabarro, D., Hainzelin, E., Guillou, M., Andersen, I., ... & Verburg, G. (2018). Food systems for sustainable development: proposals for a profound four-part transformation. *Agronomy for sustainable development*, *38*(4), 41. https://doi.org/10.1007/s13593-018-0519-1

Coronado, P. D. U., Lynn, R., Louhichi, W., Parto, M., Wescoat, E., & Kurfess, T. (2018). Part data integration in the Shop Floor Digital Twin: Mobile and cloud technologies to enable a manufacturing execution system. *Journal of manufacturing systems*, *48*, 25-33. https://doi.org/10.1016/j.jmsy.2018.02.002

Dia, C. J. N., Buama, C. A. C., Fuentes, M. D., Gonzales, M. A. S., Gloria, R. E., & Natividad, N. H. (2023). Status of E-Commerce as Correlated to the Development of Plant Community. *Journal of Social Entrepreneurship Theory and Practice*, *2*(2), 14. https://doi.org/10.31098/jsetp.v2i2.1586

Ehikioya, S. A., & Guillemot, E. (2020). A critical assessment of the design issues in e-commerce systems development. *Engineering Reports*, *2*(4), e12154. https://doi.org/10.1002/eng2.12155

Grönroos, C. (1998). Marketing services: the case of a missing product. *Journal of business & industrial marketing*, *13*(4/5), 322-338. https://doi.org/10.1108/08858629810226645

Handayani, P. (2024). Design Application Service E-Commerce Web Based Ornamental Plants. *Journal of Agrocomplex and Engineering*, *1*(1), 17-23.

Holsapple, C. W., & Singh, M. (2000). Toward a unified view of electronic commerce, electronic business, and collaborative commerce: A knowledge management approach. *Knowledge and Process Management*, *7*(3), 151-164. https://doi.org/10.1002/1099-1441(200007/09)7:3%3C151::AID-KPM83%3E3.0.CO;2-U

Jia, X., & Zhu, T. (2025). Rural digital economy drives rural industrial development through quality, efficiency, and dynamism transformations in China. *Frontiers in Sustainable Food Systems*, *9*, 1642097. https://doi.org/10.3389/fsufs.2025.1642097

Kedah, Z. (2023). Use of e-commerce in the world of business. *Startupreneur Business Digital (SABDA Journal)*, *2*(1), 51-60. https://doi.org/10.33050/sabda.v2i1.273

Kwilinski, A., Volynets, R., Berdnik, I., Holovko, M., & Berzin, P. (2019). E-Commerce: Concept and legal regulation in modern economic conditions. *J. Legal Ethical & Regul. Isses*, *22*, 1.

Lyytinen, K., & Rose, G. M. (2003). The disruptive nature of information technology innovations: the case of internet computing in systems development organizations. *MIS quarterly*, 557-596. https://doi.org/10.2307/30036549

Man, N., Tanos, M. M. M., & Kemat, N. (2023). Consumers' Preference in Online Purchasing of Ornamental Plants in the Klang Valley, Malaysia. *Malaysian Journal of Agricultural Economics*, *30*(1). https://doi.org/10.36877/mjae.a0000436

Park, S. T., Kim, Y. R., Jeong, S. P., Hong, C. I., & Kang, T. G. (2016). A case study on effective technique of distributed data storage for big data processing in the wireless internet environment. *Wireless Personal Communications*, *86*(1), 239-253. https://doi.org/10.1007/s11277-015-2794-3

Tazkia, ZZ (2019). Design of Profit and Loss Financial Report Accounting Information System at Eatboss Restaurant Using PHP and MySQL. *Is The Best Accounting Information Systems and Information Technology Business Enterprise This Is Link for OJS Us* , *4* (1), 426–440. https://doi.org/10.34010/aisthebest.v4 i1.1831

Vera-Baquero, A., Colomo-Palacios, R., & Molloy, O. (2016). Real-time business activity monitoring and analysis of process performance on big-data domains. *Telematics and Informatics*, *33*(3), 793-807. https://doi.org/10.1016/j.tele.2015.12.005

Wang, W., & Reani, M. (2017). The rise of mobile computing for Group Decision Support Systems: A comparative evaluation of mobile and desktop. *International Journal of Human-Computer Studies*, *104*, 16-35. https://doi.org/10.1016/j.ijhcs.2017.02.008

Wu, J. H., & Hisa, T. L. (2008). Developing e-business dynamic capabilities: an analysis of e-commerce innovation from I-, M-, to U-commerce. *Journal of Organizational Computing and Electronic Commerce*, *18*(2), 95-111. https://doi.org/10.1080/10919390701807525