

Design and Development of an Ornamental Plant E-Commerce Mobile Application (Floramart) Using the Flutter and Laravel Frameworks

Annisya Febriana Lubis¹, M.Arsaly Altaaf Neutron², Aidil Auliansyah³, Nur Fadhillah⁴, Neyna Arifa Putri⁵, Angga Pratama^{6*}

^{1,2,3,4,5,6}Program Studi Sistem Informasi, Universitas Malikussaleh

Annisya.230180149@mhs.unimal.ac.id¹, arsaly.230180151@mhs.unimal.ac.id², aidil.230180160@mhs.unimal.ac.id³,
nur.230180163@mhs.unimal.ac.id⁴, neyna.230180166@mhs.unimal.ac.id⁵, anggapratama@unimal.ac.id^{6*}

Abstract

Currently, the sale of ornamental plants still heavily relies on conventional transactions and social media, resulting in unstructured order recording and limited market reach. This necessitates a digital transformation to improve operational efficiency and expand marketing areas. This study aims to design and develop a mobile e-commerce application prototype specifically for ornamental plants named Floramart. The development utilizes the Flutter framework on the frontend to produce a responsive cross-platform user interface. On the backend, the Laravel framework is used to securely manage product databases, transactions, and user authentication. The system development method used is the Prototype Method, which includes requirement gathering, system design, system building, and prototype evaluation. The result of this research is a Floramart application prototype integrated with a payment gateway (Midtrans) and automatic shipping cost calculation as well as tracking services Biteship. The implementation of this system is expected to provide transaction convenience for consumers and help ornamental plant MSMEs manage sales more effectively and systematically.

Keywords: E-Commerce, Floramart, Flutter, Laravel, Ornamental Plants

1. Introduction

The rapid development of information technology has had a significant impact on various business fields, including the Micro, Small, and Medium Enterprises (MSMEs) sector engaged in the sale of ornamental plants and agribusiness [1]. The utilization of digital technology in business activities is an important factor in improving service quality, accelerating transaction processes, and expanding marketing reach to consumers [2]. Especially in the modern era, system digitalization is highly essential for managing information to respond to complaints and optimally improve customer service quality. Nevertheless, the implementation of digital transformation among ornamental plant business actors has not been carried out optimally [3].

The results of observations and interviews conducted with several ornamental plant business actors in the Lhokseumawe area indicate a number of problems in their operational activities. Most marketing and sales activities still rely on conventional methods or merely use social media as a promotional tool. The use of such social media has not been able to support systematic order management or stock recording because it is not designed as a business management platform [4]. This condition often causes various obstacles, such as errors in recording order data, ineffective recapitulation processes, and difficulties in monitoring product delivery status to customers. In addition, consumers also frequently face limitations in obtaining information regarding product availability, actual price changes, and limited payment method options. Therefore, a solution in the form of a mobile application system is needed to digitize all these business processes in an integrated manner.

Several previous studies have provided a foundation for the development of the proposed system. The first study produced a mobile-based e-commerce application called "YoPlant," designed specifically for plant and gardening equipment transactions as an alternative to the limitations of social media marketing [4]. Subsequent research developed a flower bouquet ordering application using Flutter, which proved to be able to assist customers in choosing products while simultaneously improving service quality [5]. From the back-end perspective, the implementation of a Laravel-based e-commerce prototype in a florist business successfully provided automatic shipping cost calculation features and payment gateway integration, although its use was still limited to the website platform [6]. Other research shows that integrating a payment gateway in an Android application plays an important role in providing a safer, more practical, and integrated payment system [7]. In line with this, the development of a mobile commerce application proves that an Android-based interface is highly effective in making it easier for customers to place orders online and assisting sellers in managing product order data [8]. Furthermore,

from the aspects of security and performance, research related to the structural design of an e-commerce prototype emphasizes the importance of a robust system to prevent data theft threats and minimize the risk of server overload (deadlock) when processing numerous transactions [9].

Based on this literature review, there is still a gap analysis or research gap that can be further developed. To date, not many e-commerce systems specifically for ornamental plants have been found that integrate a Laravel back-end, a Flutter-based cross-platform mobile interface, and third-party services to support payment automation and delivery tracking within a single integrated system.

Therefore, this study intends to design and build an ornamental plant mobile e-commerce application named "Floramart." The application development is carried out using Flutter as the front-end and Laravel as the back-end. The built system is expected to be able to support the comprehensive digitalization of the ornamental plant sales business processes, ranging from product catalog management and secure digital payment transactions to real-time delivery tracking features. The ultimate expectation is that the Floramart application can become an effective solution for increasing operational efficiency while supporting the modernization of the ornamental plant business in the digital era.

2. Research Methodology

2.1. Research Stages

The Prototype method is used as the system development method in this research. The main focus of the Prototype method is to create an initial model of a system to test and gather feedback before developing the final version [6]. The use of this method allows developers to identify shortcomings and make improvements before the system is fully implemented. The stages of the prototype method can be seen in Figure 1 below.

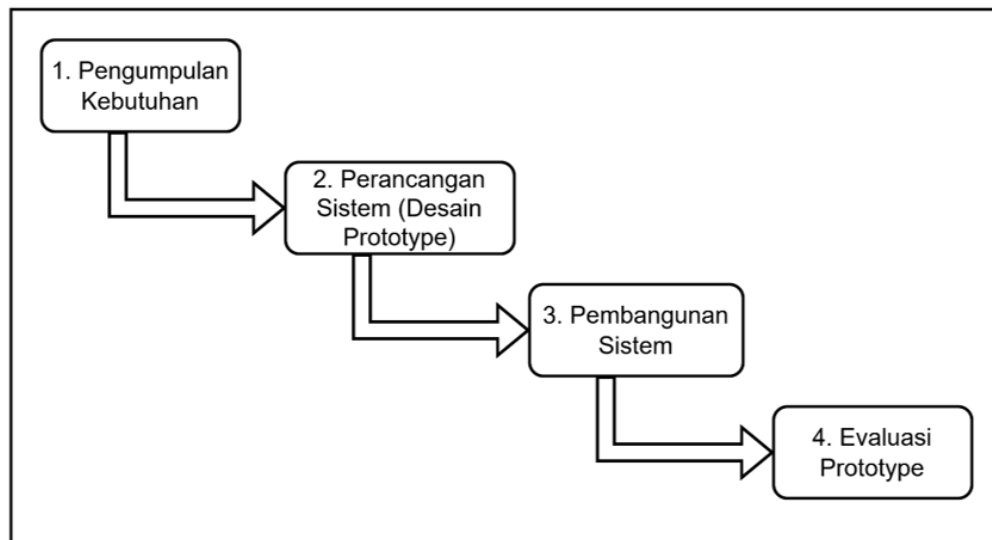


Fig. 1: Stages of the Prototype Method

Adapun Tahapan metode *prototype* yang diterapkan dalam penelitian ini adalah sebagai berikut.

1. Requirement Gathering
Identifying functional requirements from the perspective of the user and the administrator (admin) through observation. This stage also determines the need for third-party service integration for e-commerce operations, which is essentially the process of buying and selling products electronically by consumers through the internet network [10].
2. System Design (Prototype Design)
Designing the system architecture using the Unified Modeling Language (UML). UML is a powerful and essential visual approach in the modern software development world for comprehensively designing systems [2].
3. System Development
Translating the prototype design into program code using the Flutter and Laravel frameworks. The system is also integrated with a third-party payment gateway [7].
4. Prototype Evaluation
Conducting internal testing and evaluation of the core functions of the application prototype to ensure that integration with external services runs well and the system has met user expectations.

2.2. System Design (UML)

The Unified Modeling Language (UML) is a modeling language utilized to represent the structure and behavior of a software system. UML is capable of depicting static aspects, such as system structure, as well as dynamic aspects related to the interactions between components. Therefore, UML is widely used as a tool in the software analysis and design process that applies an object-oriented approach [11]. Thus, the design of the Floramart system is modeled using the Unified Modeling Language (UML), which is applied to visualize, describe, and document numerous elements of the software system [2].

2.3. Use Case Diagram

A Use Case Diagram is a modeling technique in information system design used to describe the interaction between actors and the system being developed. This diagram shows various functions that can be executed within the system as well as the relationship between users and available services. In the Floramart system, there are two main actors, namely User and Admin, who interact directly with the application. Additionally, the system is also connected to two external services, namely Midtrans as the digital payment service provider and Biteship as the shipping cost calculation and tracking service [12].

1. User Actor

Can register, log in, search for and view product details, manage the shopping cart, update profiles, view order history, interact through chat with the admin, and track shipments. During the checkout process, the system automatically includes the Biteship shipping cost check process and the payment process (Midtrans). Midtrans was chosen because it is a payment gateway that facilitates the needs of online businesses by providing efficient services across various payment methods [7]. The User Use Case Diagram can be seen in Figure 2 below.

2. Admin Actor

Has full access rights after logging in to manage product data, promotional banners, view incoming order lists, and reply to chats from users [13]. The Admin Use Case Diagram can be seen in Figure 2 below.

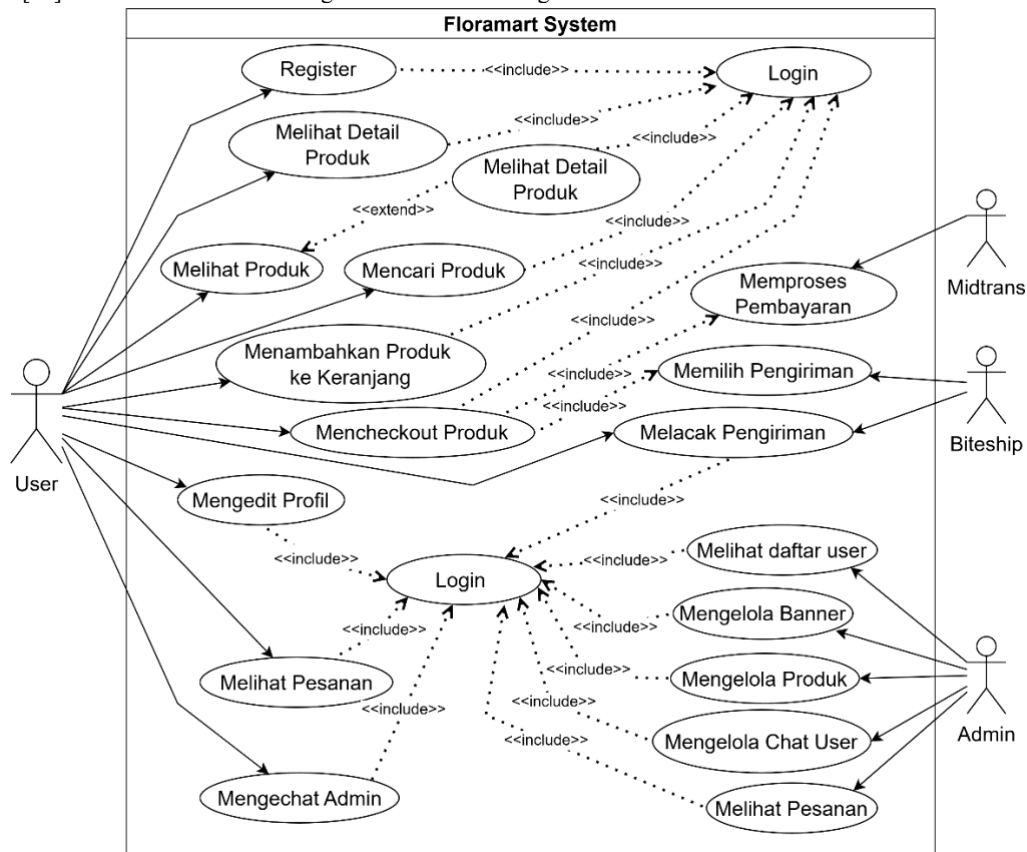


Fig. 2 Floramart E-commerce Admin Activity Diagram

2.4. Activity Diagrams

An activity diagram illustrates the structured flow of system processes from start to finish, where each activity step is visually represented [12]. Another source states that an Activity Diagram is one of the diagrams in the Unified Modeling Language (UML) used to depict the flow of activities or workflows occurring within a system or business process. This diagram illustrates how each activity is executed sequentially, starting from the initial condition, transitioning between activities, until reaching the final condition. Consequently, the Activity Diagram helps visualize the progression of a process, making it easier to understand and analyze [14].

1. Checkout Activity

The flow begins when the user performs a checkout. The system calculates the total price, then forwards the location data to Biteship for shipping cost estimation. Subsequently, Midtrans processes the payment. If successful, the order is saved and the system displays a confirmation. The Checkout Activity Diagram can be seen in Figure 3 below.

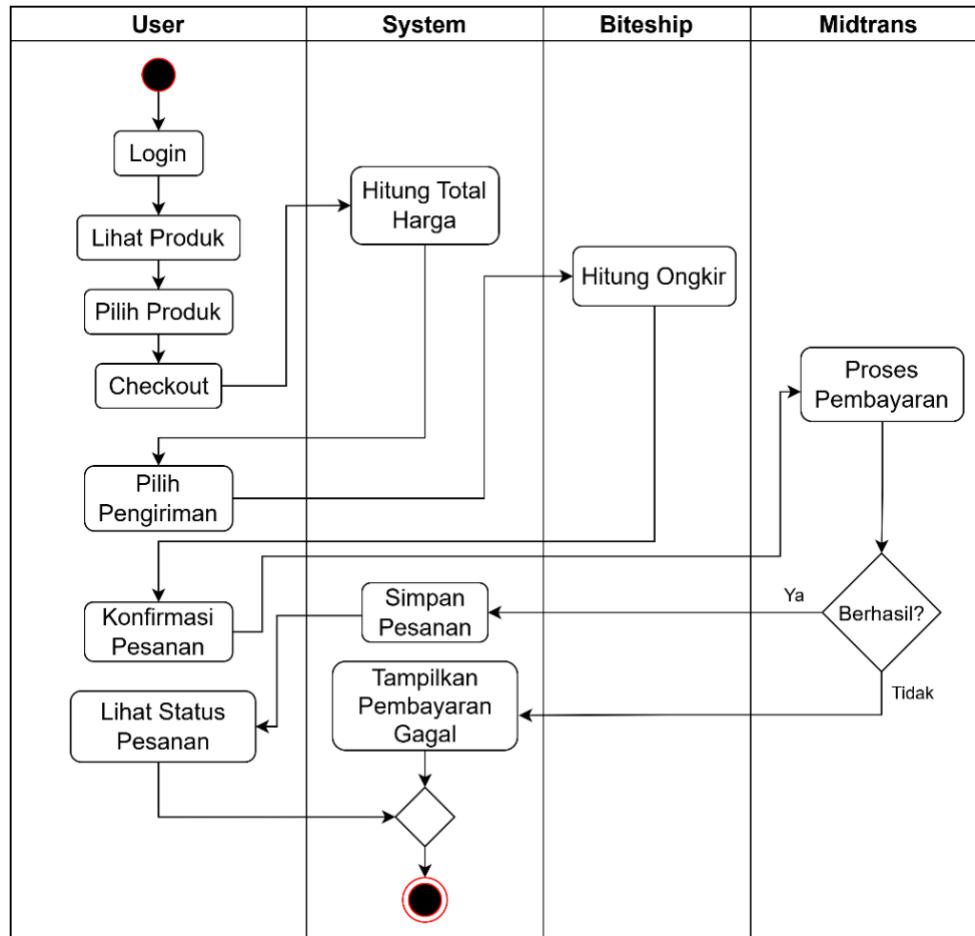


Fig. 3 Floramart E-commerce Checkout Activity Diagram

2. Tracking Activity

When the user tracks an order, the system retrieves the tracking number from the database and forwards it to Biteship. Biteship processes the tracking and sends shipping status updates to the user. The Tracking Activity Diagram can be seen in Figure 4 below.

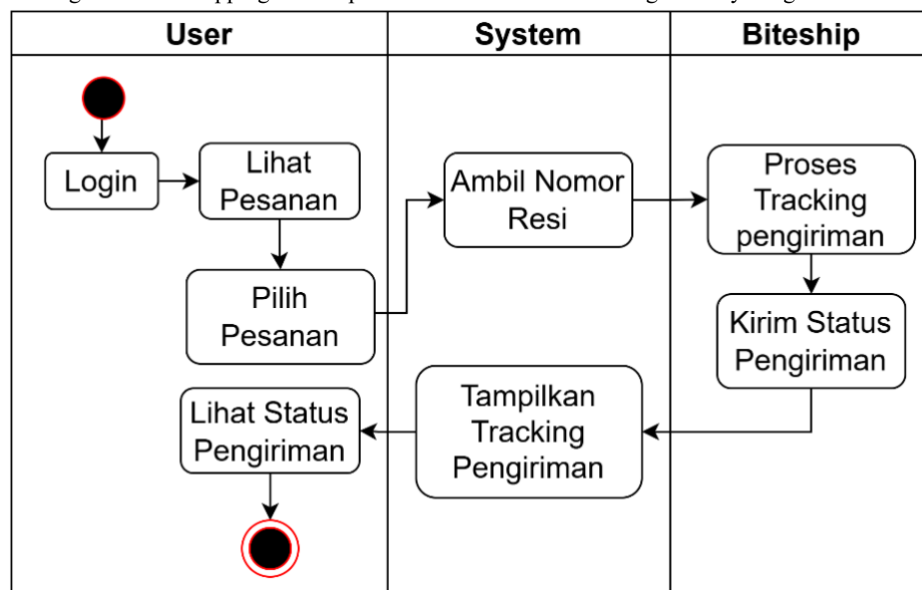


Fig. 4 Floramart E-commerce Tracking Activity Diagram

3. Admin Activity

The admin can select the "Product" or "Banner" management menu to perform data addition, modification (editing), or deletion operations. Every change will be saved to the database, and the system provides a success notification. The Admin Activity Diagram can be seen in Figure 5 below.

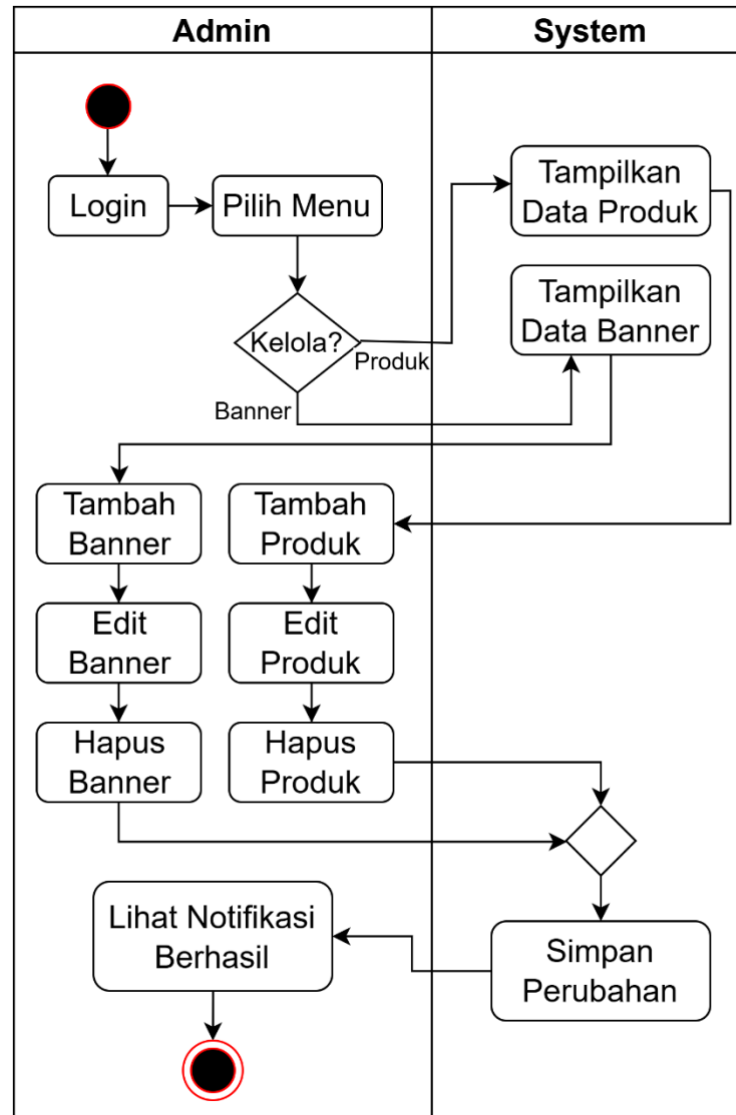


Fig. 5 Floramart E-commerce Admin Activity Diagram

3. Implementation and Discussion

This section presents the results of the implementation and development stages of the Floramart system based on the designed prototype. The system is divided into two main interfaces: a Flutter-based mobile application for customers and a Laravel-based web dashboard for the admin [15].

3.1. User Interface Implementation (Mobile Application)

New users are required to complete the registration process first by filling in some personal data, such as their full name, email address, phone number, and password. This data is used as the user's identity to securely access all services available on the system. In addition to the manual registration method, the system also provides a Login with Google (Single Sign-On/SSO) feature that allows customers to log in using their existing Google accounts. This feature is designed to provide convenience and accelerate the authentication process, so users do not need to create or remember a separate new account. With these two login method options, the system is expected to improve convenience and user experience in accessing Floramart services.

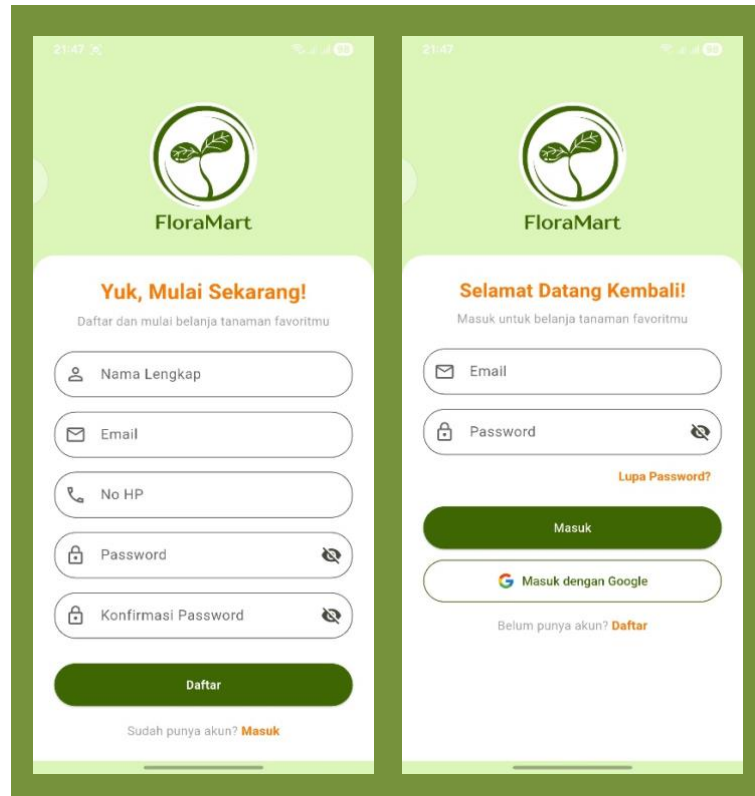


Fig. 6 Registration and Login Page

The main page displays informative promotional banners and a search feature. Below it, there is a catalog of ornamental plant products (such as Texas Sage, Cycads, Crotons, etc.) along with their prices. Customers can directly press the add button to add products to the shopping cart. The digitalization of this catalog serves as an effective solution to replace conventional promotions [4].

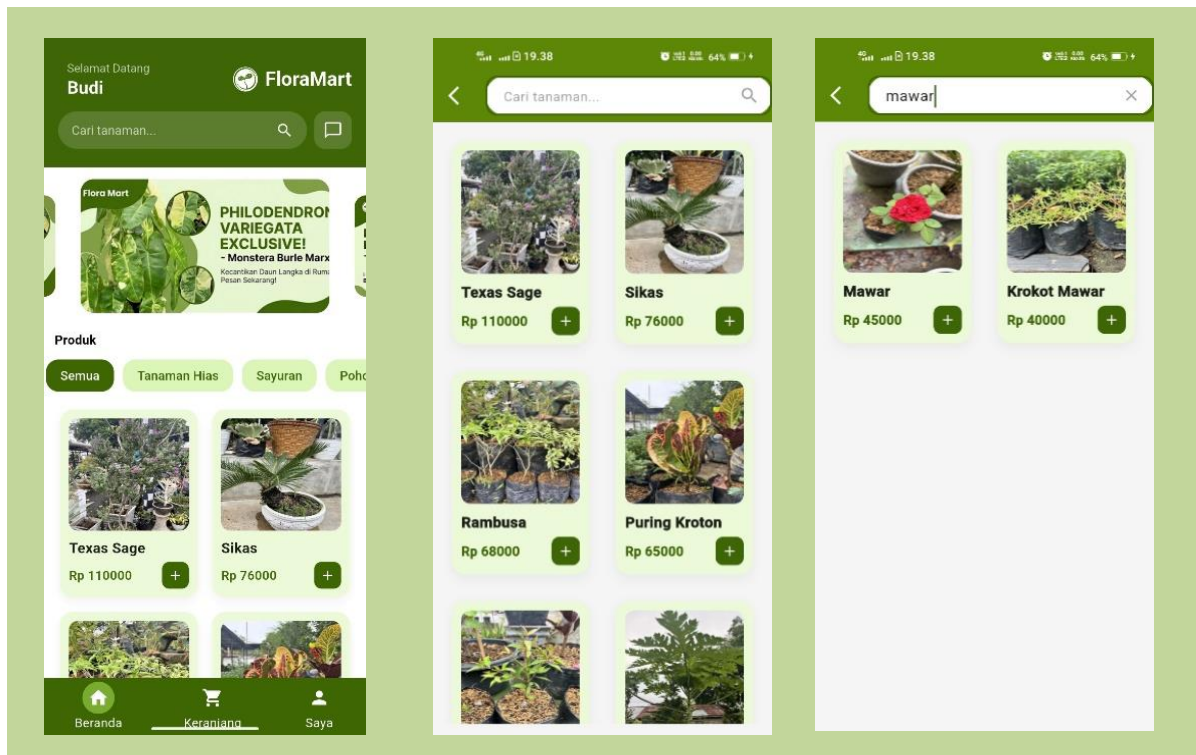


Fig. 7 Home Page and Search

The Shopping Cart (My Cart) page displays the list of selected ornamental plants. The system automatically calculates the total price based on the item quantity set by the customer before pressing the "Buy" button to proceed to the checkout process.

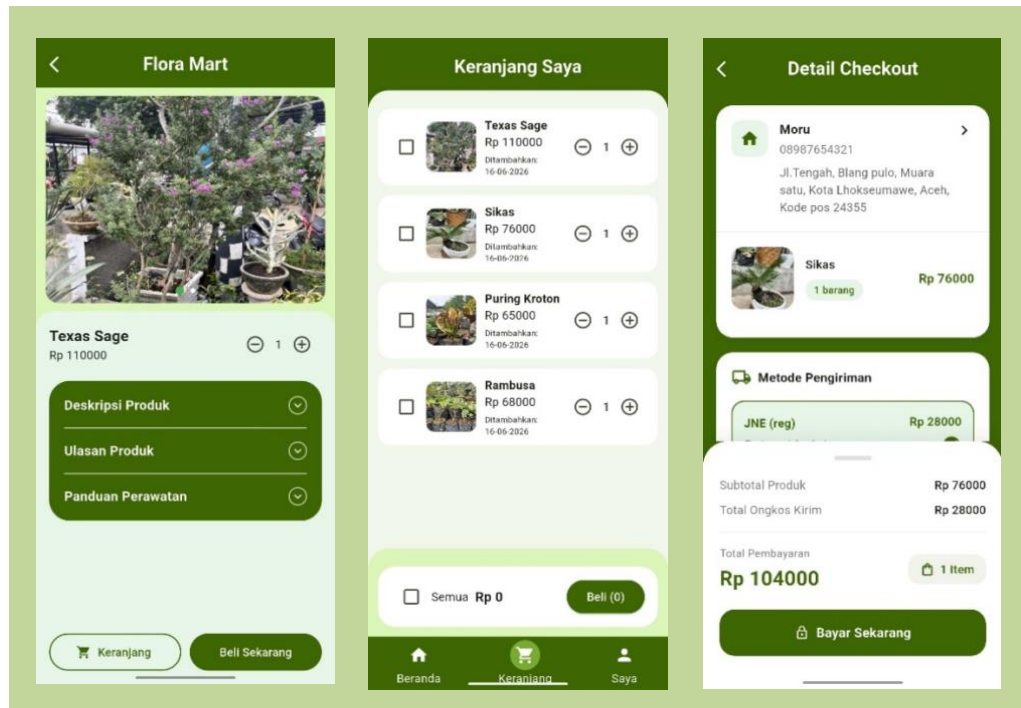


Fig. 8 Product Detail Page, Cart (My Cart), and Shipping Selection

After the checkout process, the system displays a payment page integrated with the Midtrans payment gateway. The system will generate a unique Order ID along with the total bill. Customers are provided with various comprehensive and secure payment method options, ranging from QRIS, digital wallets (GoPay), and Virtual Accounts of various banks (BCA, Mandiri, BNI, etc.), to credit/debit cards [7].

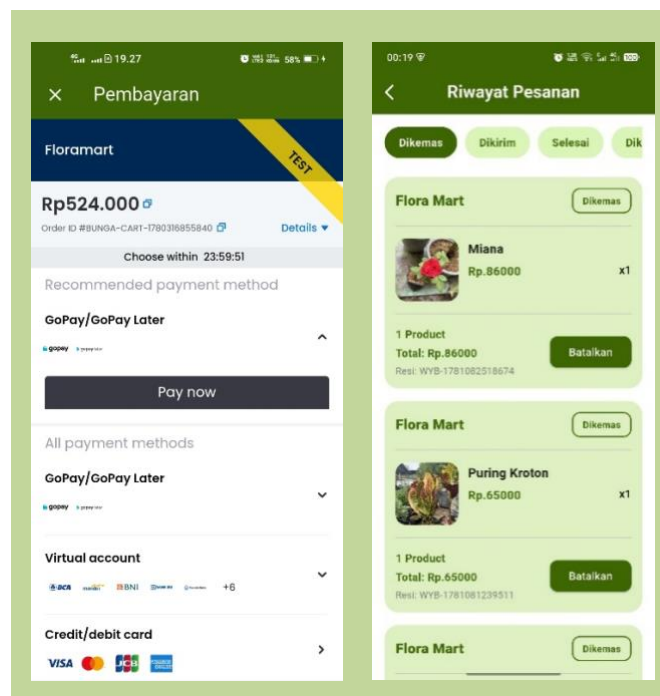


Fig. 9 Midtrans Payment Page and Order History

Tracking Page (Location Map) This feature is integrated with the Biteship delivery service API. This page visually displays the delivery route map from the store to the destination location. The Live Tracking and Estimated Delivery features allow customers to accurately monitor product shipments, including to local destination areas such as the Lhokseumawe region and its surroundings. This resolves the issue of tracking difficulties in conventional transactions [6].

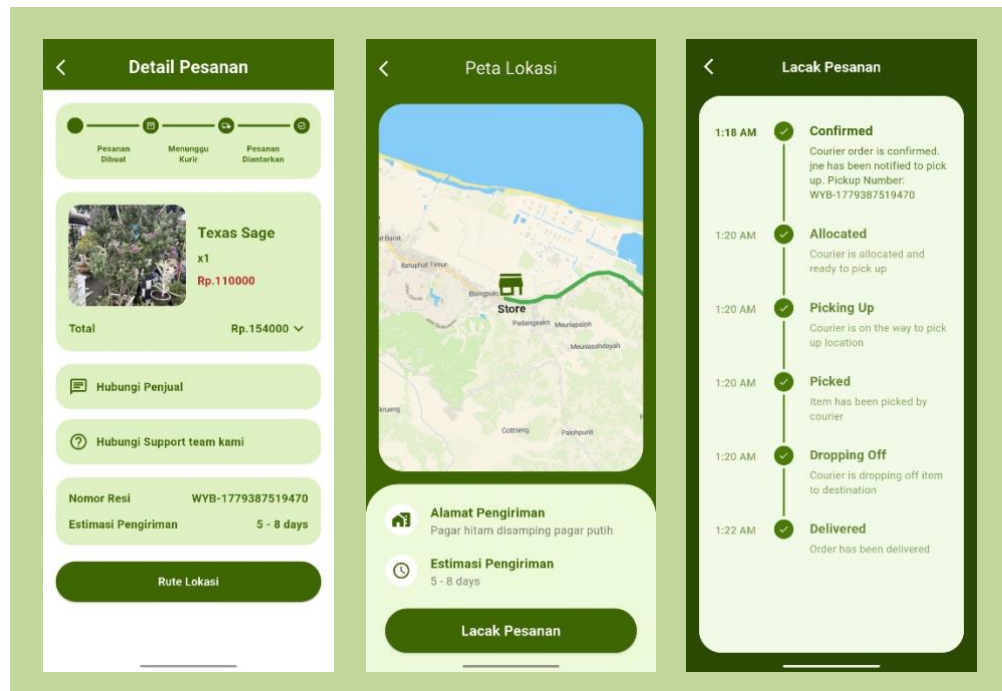


Fig. 10 Tracking Page (Location Map)

3.2. Implementation of Admin Dashboard (Web Backend)

Admin Dashboard Page Displays key metrics concisely, namely Total Orders, Total Revenue, and Today's Orders. At the bottom, there is a "Latest Orders" table that displays the customer's name, real-time order status (such as "Returned", "Completed", or "Cancelled"), along with the total transaction. This structured recording directly addresses the issue of manual data recapitulation, which is prone to human error [12].

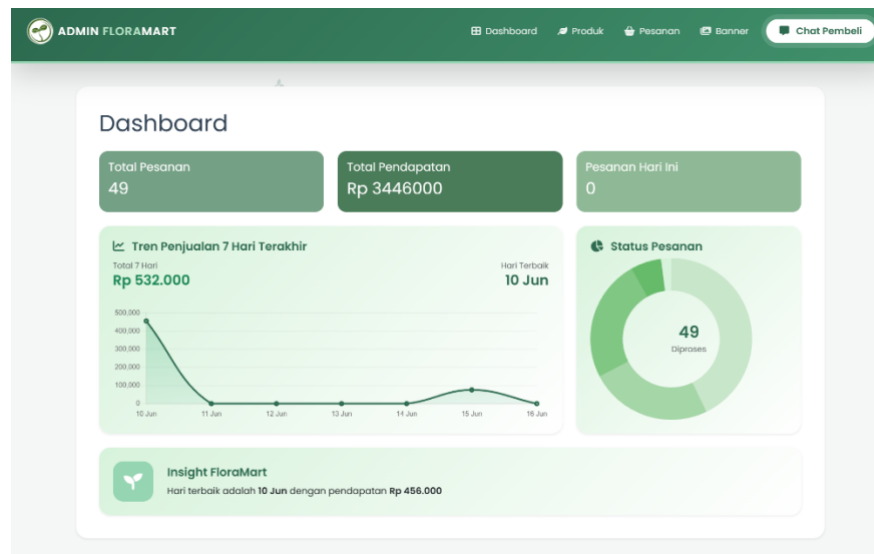


Fig. 11 Admin Dashboard Page

Figure 12 shows the Order List page on the Floramart admin system, which is used as a means to manage and monitor customer order data. Order information is presented in a table format that includes the customer's name, order status, total price, as well as actions that can be performed by the admin. The order status is displayed using labels with different colors, such as Returned, Completed, and Cancelled, thereby facilitating the process of identifying the order condition. Each order data entry is also equipped with a Detail button that functions to display more comprehensive order information. Furthermore, the top right section of the page displays the total number of orders stored in the system. The interface design uses a combination of green and white colors, providing a modern and simple impression, as well as enhancing user convenience in managing order data.

NAMA PELANGGAN	STATUS PESANAN	TOTAL PEMBAYARAN	AKSI
Moru	Dibatalakan	Rp 96.000	Detail
Moru	Menunggu Pembayaran	Rp 96.000	Detail
Moru	Selesai	Rp 104.000	Detail
Moru	Dikembalikan	Rp 114.000	Detail
Moru	Dikirim	Rp 114.000	Detail
gyvbgvyg	Dikemas	Rp 276.000	Detail
Moru	Dikemas	Rp 78.000	Detail
Moru	Selesai	Rp 104.000	Detail
Moru	Selesai	Rp 104.000	Detail
Moru	Selesai	Rp 104.000	Detail
Moru	Dikemas	Rp 104.000	Detail

Fig. 12 Order List Page View on the Floramart Admin Website

4. Conclusion

Based on the results of the design and implementation that have been conducted, it can be concluded that this research has successfully built a prototype of the "Floramart" ornamental plant e-commerce mobile application by combining the advantages of the Flutter framework on the frontend and Laravel on the backend. The presence of this application is capable of addressing the issues of conventional marketing and manual data recapitulation that have been experienced by ornamental plant MSME (Micro, Small, and Medium Enterprises) players. The integration of third-party services in the form of the Midtrans payment gateway has proven effective in facilitating secure, fast, and varied digital payment transactions. Meanwhile, the utilization of the Biteship API has successfully provided transparency through the automation of shipping cost calculations and real-time order tracking down to the local level, such as the Lhokseumawe area. Furthermore, the availability of a web-based admin dashboard greatly assists store managers in monitoring revenue metrics and managing customer order histories in a much more structured manner. Overall, the implementation of the Floramart system not only provides ease and convenience in the shopping experience for consumers but also drives modernization and improves operational efficiency for ornamental plant businesses in the digital era.

References

- [1] Z. Meilany, E. Rohman, N. Sofiana, and R. Ripai, "Transformasi Digital Bisnis Buket melalui Sistem Penjualan Online Berbasis Aplikasi Mobile," *Blend Sains Jurnal Teknik*, vol. 4, no. 1, pp. 105–115, Jul. 2025, doi: 10.56211/blendsains.v4i1.986.
- [2] F. Rozi, F. Santoso, and A. Baijuri, "Rancang Bangun E-Commerce Berbasis Web (Studi Kasus Toko Izzuna Collection) Website Based E-Commerce Design (Case Study of Izzuna Collection Store)," *Jurnalnya Orang Pintar Komputer*, vol. 14, no. 2, 2025, doi: 10.30591/smartcomp.v13i1.7997.
- [3] M. Fathi Azzumar and E. Nurmia, "PERANCANGAN KNOWLEDGE MANAGEMENT SYSTEM PADA E-COMMERCE XYZ BERBASIS MOBILE," 2021. [Online]. Available: <https://jurnal.umj.ac.id/index.php/just-it/index>
- [4] C. D. Utami, M. W. Worth, R. R. M. Salim, and H. Handoko, "Analisis dan Perancangan E-Commerce 'YoPlant' Berbasis Mobile," *remik*, vol. 7, no. 1, pp. 63–73, Jan. 2023, doi: 10.33395/remik.v7i1.11941.
- [5] M. Raihan and A. T. Hidayat, "Rapid Application Development (RAD) dalam Pengembangan Aplikasi E-Commerce Berbasis Mobile," *MALCOM: Indonesian Journal of Machine Learning and Computer Science*, vol. 5, no. 1, pp. 93–100, Dec. 2024, doi: 10.57152/malcom.v5i1.1742.
- [6] A. Handayani and S. Muzid, "Pengembangan Prototype E-commerce Bouquet Bunga Berbasis Laravel dengan Integrasi Rajaongkir dan Midtrans," vol. 4, no. 5, pp. 1162–1173, 2025, [Online]. Available: <https://ojs.trigunadharma.ac.id/index.php/jsi>
- [7] Satria M and Hermawan A, "PENERAPAN PAYMENT GATEWAY PADA SISTEM PENJUALAN TIKET KONSER BERBASIS ANDROID DENGAN TEKNOLOGI QR," *JURNAL INFORMATIKA TEKNOLOGI DAN SAINS (JINTEKS)*, vol. 7, pp. 1848–1857, Nov. 2025.
- [8] M. Sari and S. Andriasari, "Perancangan Aplikasi Mobile E-Commerce Berbasis Android pada Natasya Butik," *remik*, vol. 7, no. 1, pp. 444–451, Jan. 2023, doi: 10.33395/remik.v7i1.12060.
- [9] F. T. A. Hussien, A. M. S. Rahma, and H. B. A. Wahab, "Design and implement a new secure prototype structure of e-commerce system," *International Journal of Electrical and Computer Engineering*, vol. 12, no. 1, pp. 560–571, Feb. 2022, doi: 10.11591/ijece.v12i1.pp560-571.
- [10] P. Gede, S. Cipta Nugraha, I. Putu, Y. Indrawan, I. Kadek, and A. Asmarajaya, "RANCANG BANGUN SISTEM INFORMASI E-COMMERCE BERBASIS WEBSITE (STUDI KASUS TOKO KOMPUTER DI DENPASAR)," *INSERT: Information System and Emerging Technology Journal*, vol. 3, no. 1, p. 53, 2022.
- [11] BINUS University, "Perbedaan DFD dan UML dalam Pemodelan Sistem," Jul. 2024. [Online]. Available: <https://binus.ac.id/bekasi/2024/11/perbedaan-dfd-dan-uml-dalam-pemodelan-sistem/>
- [12] A. Tirta Adrianta, H. Dewi Ariessanti, P. Setiawati, and A. Ichwani, "RANCANG BANGUN SISTEM PEMESANAN BERBASIS WEBSITE DENGAN QR CODE MENGGUNAKAN WATERFALL DI CAFE EAU DE COFFEE," *INSERT: Information System and Emerging Technology Journal*, vol. 6, no. 1, 2025.
- [13] Sufandi Utan U and Triharningsari D, "PPENGEMBANGAN APLIKASI MOBILE SITTA UNIVERSITAS TERBUKA BERBASIS ANDROID," *INSERT: Information System and Emerging Technology Journal*, vol. 3, Jun. 2022.
- [14] Dicoding Intern, "Memahami Activity Diagram beserta Cara Membuatnya," 2021. [Online]. Available: <https://www.dicoding.com/blog/memahami-activity-diagram/>
- [15] A. S. Mutia, S. Sarji, A. Munawar, T. Aljauza, T. Budiman, and R. Rosmini, "Perancangan dan Pengembangan Aplikasi E-Commerce untuk Pemesanan Buket Bunga Berbasis Flutter: Studi Kasus Toko Bunga Kisah Kita," *Buletin Sistem Informasi dan Teknologi Islam*, vol. 6, no. 2, pp. 58–66, May 2025, doi: 10.33096/busiti.v6i2.2803.