

Implementation of Prototype Method on Online Fruit Store Service Application Using Flutter Framework

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ABSTRACT

Wein's Fresh Store is a distributor that sells local and imported fruits. However, the store still uses manual sales transactions. This results in inadequate transaction effectiveness in bridging transactions to buyers. To overcome this problem, an electronic trading platform called Wein's Fresh Apps was created, based on the Android mobile platform using Android mobile devices as a transaction medium. Through the Android application installed on mobile devices, users can easily sell and buy products in the online store. The Android-based online store has many advantages for users, including easier access and higher mobility, wider time flexibility, and a wider selection of products. Various attractive features such as the use of discount coupons, a secure payment system, and fast and reliable delivery further enhance the shopping experience in the Android-based online store. Wein's Fresh Store is a mobile-based online sales application using the prototype method. The prototyping technique is a method used to quickly gather information about user needs for software. This method focuses on presenting the software aspects that will be seen by customers or users. To build Wein's Fresh Apps application, the Dart programming language and the Flutter framework were used. Flutter is a popular cross-platform framework used to develop mobile and iOS applications. This framework is specifically designed to build mobile application interfaces (UI). Wein's Fresh Apps was created to facilitate store buyers in making purchases through the application, so they no longer need to come directly to the store.

Keywords: *Android, Flutter, prototype, Framework, mobile*

ABSTRAK

Toko *Wein's Fresh* adalah distributor yang membeli buah lokal dan impor. Namun toko tersebut masih menggunakan transaksi penjualan secara manual. Hal ini mengakibatkan keefektifan dalam bertansaksi untuk menjembatani transaksi ke pembeli kurang memadai. Untuk mengatasi masalah ini, maka dibuatlah sebuah platform perdagangan elektronik bernama *Wein's Fresh Apps* yang berbasis *mobile Android* menggunakan perangkat seluler *Android* sebagai media transaksinya. Melalui aplikasi *Android* yang terinstal di perangkat seluler, pengguna dapat dengan mudah menjual dan membeli produk di toko online tersebut. Toko online berbasis *mobile Android* memiliki banyak keuntungan untuk pengguna, di antaranya adalah kemudahan akses dan mobilitas yang lebih tinggi, fleksibilitas waktu yang lebih luas, dan pilihan produk yang lebih banyak dan bervariasi. Berbagai fitur menarik seperti penggunaan kupon diskon, sistem pembayaran yang aman, dan pengiriman yang cepat dan terpercaya, semakin meningkatkan pengalaman berbelanja di toko online berbasis *mobile Android*. Toko *Wein's Fresh* adalah aplikasi penjualan online yang berbasis mobile dengan metode *prototype*. Teknik *prototyping* adalah metode yang digunakan untuk dengan cepat mengumpulkan informasi tentang kebutuhan pengguna tentang perangkat lunak. Metode ini berfokus pada presentasi aspek-aspek perangkat lunak yang akan terlihat oleh pelanggan atau pengguna. Untuk membangun aplikasi *Wein's Fresh Apps*, digunakan bahasa pemrograman *dart framework Flutter*. *Flutter* merupakan sebuah *cross-platform framework* yang populer digunakan untuk mengembangkan aplikasi mobile dan iOS. Framework ini dirancang khusus untuk membangun antarmuka (UI) aplikasi mobile. *Wein's Fresh Apps* ini dibuat untuk memudahkan pembeli toko dalam melakukan pembelian barang melalui aplikasi, sehingga tidak perlu lagi datang langsung ke toko tersebut.

Kata Kunci: *Android, Flutter, prototype, Framework, mobile*.

INTRODUCTION

In this increasingly advanced digital era, many technological innovations enable human life to become easier and more efficient. One example is the use of mobile applications, which have become a very important and necessary thing for many users in various fields, whether for business, education, entertainment, or even for daily needs. With mobile applications, users can quickly and accurately obtain information, access various services and products online, communicate easily with others around the world, as well as increase productivity and efficiency in carrying out various activities. Therefore, the presence of mobile applications is very important in supporting the modern fast-paced, and practical lifestyle of humans. (Kurale et al., 2021). The rapid and dynamic development of technology in the current era has brought many changes in various aspects of human life. However, on the other hand, technological advancements also have complex and not always positive impacts on society. Sometimes, rapid and constantly

changing technological advances can cause many people to have difficulty in using them effectively. Not everyone has the ability or opportunity to keep up with technological developments, especially for those who are not used to or less familiar with the use of technology. Although technology has developed rapidly in the last few decades, the reality is that many people are still unable or even unable to utilize it optimally. Along with the rapid advancement of technology, it should provide convenience for people in carrying out various daily activities. Although technological developments have great potential to bring significant changes and progress to society, in reality, there are still many challenges and obstacles that hinder the optimal implementation of technological developments.

Many people go about their daily lives without utilizing the available technology. They only use technology for entertainment purposes and not to help make their lives easier. An example of this is at Wein's Fresh Shop, a local and imported fruit distributor that still uses manual transactions to record stock data, ordering processes, and delivery. This can hinder the progress of the fruit shop because the seller will have difficulty monitoring and checking how much fruit stock is still available and which ones have run out. In the ordering process, the seller will also have difficulty if there

are any mistakes or unclear orders. Many merchants still use manual transactions today, even though manual transactions are becoming less effective. With the development of technology, it would be easier to facilitate the buying and selling process, both in transactions and data recording (Pranita et al., 2019). Selling manually has many weaknesses, especially in terms of recording errors and difficulties in finding data because the seller has to look into the large book every time they need to find data.

In today's era of rapid technological advancement, many businesses are moving to the online realm, including fruit stores. Online fruit stores provide a solution for consumers who want to buy fresh fruit easily and quickly without having to go to a physical store. Online fruit stores not only make it easier for customers to find fresh fruit but also make it easier for sellers to sell their fruits. Sellers can be more expressive in selling their goods, for example, by offering discount vouchers, providing guarantees if the received fruit is not good, providing fast shipping guarantees, and so on. However, to create a good online fruit store, an easy-to-use and responsive application is needed. Therefore, with various problems in the digital era combined with technological advancements and innovation in the world of commerce, Wein's Fresh Apps online buying and selling application is needed.

Wein's Fresh Apps is built using the Flutter Framework. Flutter is a programming language that uses Dart and allows for the development of attractive and responsive

app interfaces (Muslim et al., 2022). The Flutter framework is widely used because it is capable of producing applications that can run well on various platforms, such as Android and iOS (Tjandra & Chandra, 2020). Flutter Framework also facilitates developers in creating attractive application interfaces. This research is used to implement the Flutter Framework in a prototype-based online fruit store service application. This online fruit store service application was created because there are distributors who still use manual sales transactions for local and imported fruits. The online fruit store service application created by the researcher using the Flutter Framework implements the prototype method.

The prototype method, according to Pressman in Fernando's article, is an approach in software application development to create a model of the application being built before actually building the real application (Fernando, 2020). By using this method, researchers can conduct testing on the prototype before the application is used commercially. The development of an online fruit store application using the prototype method has several stages, including analyzing needs, designing, creating a prototype, testing, and development. In creating the prototype, the researcher will create an initial model of the application to be built and evaluate it. After the evaluation is done, the researcher will make improvements and develop the model into an application that is ready to use

Implementing the prototype method on the online fruit store service application using the Flutter framework is expected to provide an effective solution in developing a better application that is suitable for user needs. The results of this study can be used as a reference in the development of online fruit store applications in the future.

LITERATURE REVIEW

In the current digital era, the use of information and communication technology is increasingly widespread and widely used by the community, especially in the fields of trade and business. One form of utilizing this technology is the development of commercial applications that can help business people market their products and services online, as well as increase efficiency in managing their businesses.

To develop a good and user-oriented commerce application, a systematic and structured method is needed. One of the methods that can be used is the prototype method, which is a software development technique that involves creating a model or prototype of the system gradually so that it can be tested and evaluated by users more effectively

There have been several previous studies related to applications that use the prototype method. However, there is no application yet that offers fruits and vegetables using the prototype method. Here are some of the previous studies conducted, such as the study (Yoka Fathoni et al., 2022) Creating a client-server based sales application at the WKWK store

using the prototype method aims to facilitate ordering and payment to be quick and efficient. This study also suggests that using the prototype method can provide ease in ordering, payment transactions, and data management to deliver information quickly, accurately, and integrated.

The next study is the (Winanda et al., 2022) study. The research aims to analyze and design a price detection application for Toko STARS using the prototype method. It is stated that the design of this application was made because the company still relies on the memory of employees and stamp paper in providing their services, which is considered ineffective. Therefore, a detection application was designed to facilitate and help employee performance.

The next study is the (Fernando, 2020) study. The research was conducted by developing a web-based E-Commerce using the Prototype Method for Denia Donuts Shop. This research was carried out because the sales process in Denia Donuts Shop already uses social media, but the transaction process still uses the traditional system, which is a direct transaction with customers. In reality, buyers have to fill out an order form first, while the store has difficulty finding product information because there is no automatic data capture from customers. Therefore, an E-Commerce for Denia Donuts Shop was created to help market products widely and make the transaction process easier.

The next study is the (Fitriani & Subariah, 20221) study. The research aims to design a web-based unique product photo studio service application using the prototype method. This application was created in many places in the Tangerang Seatan area*photography services, but in practice, for bookkeeping, they only use Google Spreadsheet, which takes quite a long time in the report-making process. From the existing problems at the Unique Product Photo Studio, the researcher designed an application to make it easier using the prototype method. The testing techniques used by the researcher are black box and white box. The tools used to build the system are Visual Studio Code as the text editor, MySQL to design the database, and Bootstrap as the website framework. The research resulted in a website for photo studio services at a unique product photo studio that can provide information about the studio, photo services, and gallery, and also allow photo orders to be made.

The next study is the (Mahendra et al., 2023) study. The study aimed to design and develop a rent-provide application for Rental Mobil Sahabat Purwakarta based on the Prototype Method. The application was created using the software prototype method using the Flutter programming language and Firebase as its database. The features of the Rental Now application on Rental Mobil Sahabat Purwakarta include car availability, car reservation, managing car data, managing reservation data, and managing report data. The application was tested using black box testing and was found to be functioning well. The rental application on Rental Mobil Sahabat Purwakarta was created to make it easier for the rental owner and customers to make reservations. Customers can view the real-time availability of cars at Rental Mobil Sahabat Purwakarta, while the rental owner can easily monitor car availability and facilitate the preparation of necessary reports.

Considering the issues in various sales processes, both for goods and services, the problems faced by Wein's Fruit Shop are also similar, namely the use of manual transactions. To address this issue, Wein's Fresh Apps was developed. Wein's Fresh Apps was created to facilitate the shop owner in recording and entering data on the amount of fruit and vegetable stock, as well as to simplify the purchasing process for customers and help them claim any available bonuses and discounts at Wein's Fresh. Thus, sales transactions can be carried out effectively and efficiently.

METHOD

In this study, the application was developed using the prototype method because the prototype method serves as an initial version of the system. This method will produce a system as an intermediary between the developer and the user, making it easier for the user to choose a system that suits their needs. The creation of a simple software model and basic sketching were used as a design. (Al Muhtadi & Junaedi, 2021). The stages carried out in the prototype method are data collection, design, modeling, and construction. The framework of this research can be seen in the figure below

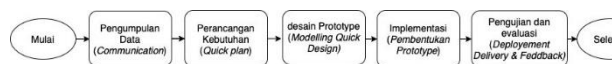


Figure 1. Framework of thought

Data Collection

In this stage, data collection was carried out using a descriptive qualitative method. Qualitative research is a type of research that produces findings that cannot be achieved using statistical procedures or other quantitative methods of quantification (Brain et al., 2023). It starts with the collection of requirements that involve developers and users to determine the operational requirements, goals, and functions of the system. The stages of data collection are as follows.

a. Observation

Observation is a method of collecting data by observing an object over a certain period and systematically recording what has been observed (Arista & Suderana, 2019).

b. Interview

An interview is a form of oral communication conducted in a structured manner by two or more people, either in person or remotely (Muslimin et al., 2022).

Requirements Design

After completing the data collection stage, the next step is the design stage. Based on the problem discussed earlier, in the system requirement design phase, the system is broken down into several smaller subsystems to make it easier to identify issues, obstacles, and opportunities in the system, as well as to determine system requirements. As a result, improvement methods can be proposed for the system (Emerson & Mulyono, 2019).

Prototype Method

In this stage, the prototype method is used. The prototype is a potential version of the system provided to developers and potential users that can provide an idea of how the system will function when it has been fully developed (Yul & Santoso, 2022). The prototype method is carried out using the Unified Modeling Language (UML). The first step is to use a use case diagram to describe the relationship or interaction between the user and the system that will describe the existing functions. Next, to illustrate the flow in the system, an activity diagram is used, and to illustrate the relationship between objects, a class diagram is used. The

prototype is created using the system requirements (Mulyono & Kholid, 2019).

Implementasi

This stage is used for modeling an application using a programming language. Implementation is the stage of executing or applying the system from the well-prepared design. The system implementation is carried out by referring to the system design and adjusting to the needs (Isoni & Setiawati, 2019). This stage is the final step of the design of an online sales information system based on an application, using both hardware and software (Al Muhtadi & Junaedi, 2021).

Testing

The testing phase is carried out to test whether the system or application is suitable for use by users. Testing is intended to determine whether the functions, inputs, and outputs of the software comply with the required specifications (Rachmatullah et al., 2020). The application testing is conducted by distributing a questionnaire to the community using Google Forms.

RESULTS AND DISCUSSION

Data collection

From the data collection phase using the descriptive qualitative method with various stages, namely observation, and interviews, it was found that the problem was that distributors who sell local and imported fruits still use manual sales transactions. This hampers transactions between distributors and consumers, making the transaction process less effective.

Requirement Design

The result of the design phase is to identify the application requirements needed to create the fruit store application. The system requirements are:

1. Computer/laptop with the following minimum specifications:
 - a. Processor: Intel Core i5 or equivalent
 - b. RAM: 8 GB or more
 - c. Storage: 256 GB SSD or more
2. The required operating system is Windows, Mac, or Linux.
3. A mobile device is needed to test the

application. Mobile devices supported by Flutter include Android and iOS

4. USB cable: A USB cable is needed to connect the mobile device to the computer/laptop and test the application
- The application requirements are:

1. IDE/Text Editor: An Integrated Development Environment (IDE) or text editor is needed to write and develop the application code. Some popular IDE/Text Editors for Flutter are Android "Studio, and Visual Studio Code.
2. Emulators can be used to test applications on virtual mobile devices without the need for physical mobile devices. Flutter provides Android and iOS emulators that can be used to test applications on each platform.
3. Firebase database, which is a database hosted in the cloud.

Prototype Method

In this method, modeling produces the following diagrams.

Use case diagram

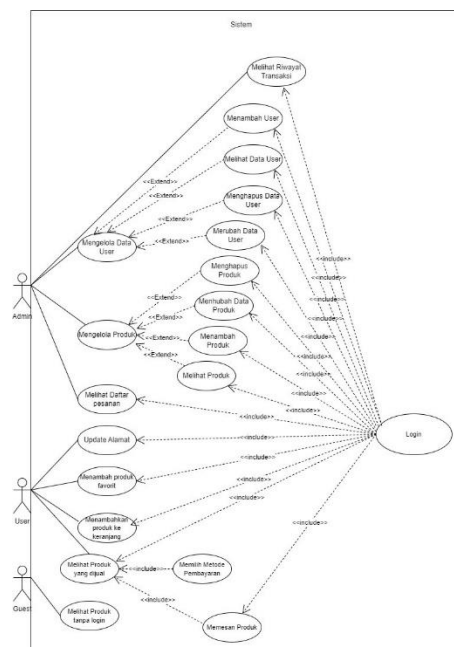


Figure 2. Use case

In figure 2, it shows the interaction between users and admins towards the system. The user interaction

with the system includes account login, selecting fruits/vegetables to purchase, ordering, and making a reservation. In addition, the admin's interaction with the system involves updating information, managing fruit or vegetable data, managing purchase data, and generating order reports.

User activity diagram user

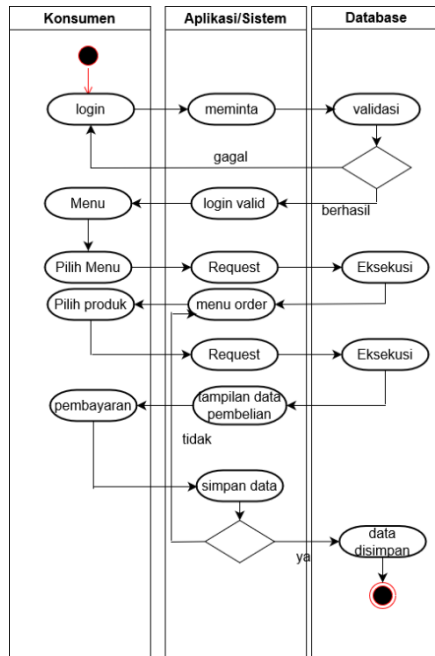


Figure 3. User activity diagram

Figure 3 shows the user's activity diagram for the application or system. The consumer or user can log in, choose a menu, select the product to be purchased, and then carry out the transaction.

Admin user activity

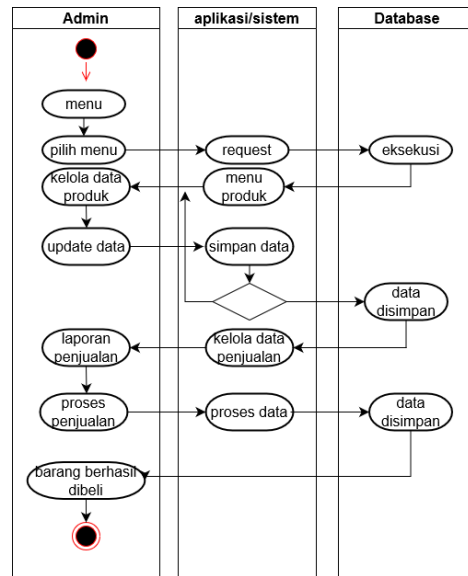


Figure 4. Admin activity diagram

diagram activity pada admin yang digambarkan pada gambar 4 adalah proses berjalannya fitur-fitur yang ada pada aplikasi yang digunakan oleh admin.

Class Diagram

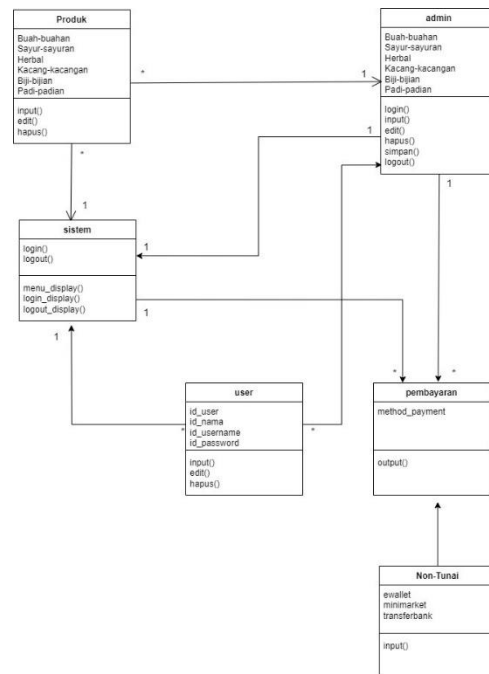


Figure 5. Class diagram

In Figure 5, there is a class diagram that illustrates the structure of the system by showing

attributes, system classes, methods, and relationships between objects.

Implementation

The construction phase involves applying the results of the modeling to the application. The results of this phase can be seen in the figure.

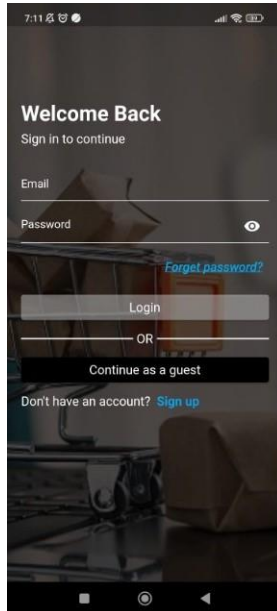


Figure 6. Login display

Figure 6 shows the login menu for users. Users can enter their email and password if they already have an account. If the user does not have an account, they must create an account in various ways, namely by signing in through Google for users who already have a Google account or by continuing as a guest to use the application only as a guest. In addition, they can also register by filling in the necessary information to create an account by clicking sign up for register as shown in Figure 7 below.

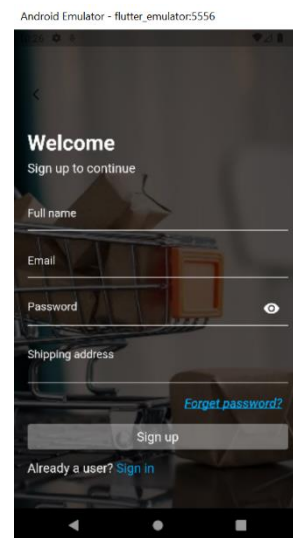


Figure 7. Register View

After the user successfully logs in, they will enter the menu. The menu in this application is located on the homepage. If the user fails to log in, they can click 'forget password' and enter the email that has been registered before, and then click 'reset now.' The forget password display can be seen in Figure 8.

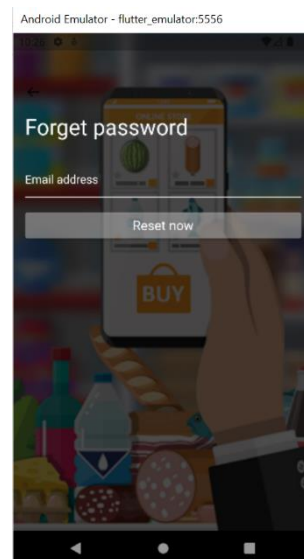


Figure 8. Forget password display

After the user successfully logs in, they will enter the homepage which can be seen in Figure 9 below.



Figure 9. Start page view

On the homepage of the application, there are various types of vegetables and fruits with their respective prices listed for each category. In addition, there are various tools such as home, categories, cart, and account. Next, to access the categories menu, please refer to Figure 10 below.



Figure 10. Categories view

The categories menu contains various types of vegetables, fruits, and grains that have been grouped into one category to help consumers choose products more easily. Next, to access the account menu, please refer to Figure 11.

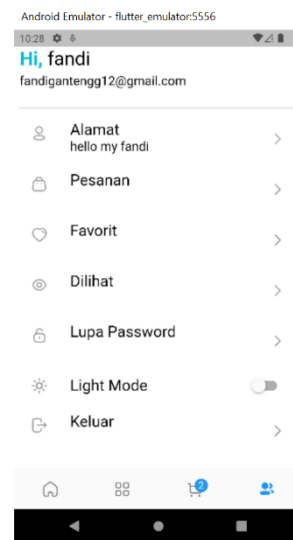


Figure 11. account view

The account menu contains various features such as address, orders, favorites, viewed, forgot password, light mode, and logout. These features or menus can be used by users to make purchases of vegetables or fruits using the application.



Figure 12. Product detail view

The menu in Figure 12 displays the details of each product. Moving on to the cart menu, consumers can see the number of items selected for the transaction. This menu can be seen in Figure 13.

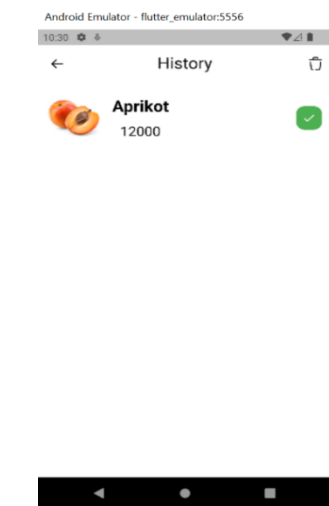


Figure 13. Cart menu display

The cart menu contains a list of products that have been selected for the transaction. Products that have been added to the cart can be canceled before making payment.



Figure 14. wishlist view

Figure 14 is a representation of the wishlist menu, which is a list of items that will be purchased at a later time. For products that have been ordered or checked out, they can be viewed on the history page which displays the purchased items. This history page can be seen in Figure 15.

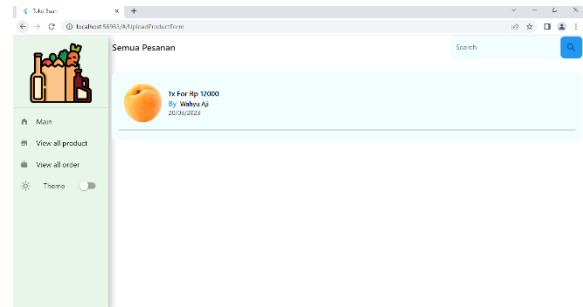


Figure 15. Display of the history page

Regardless of the application used by the user, the admin also has access to manage the application, as shown in the admin's application interface. The application used by the admin is very different from the one used by consumers. Within the admin interface, there are 4 (four) features including main, view all products, view all orders, and theme. The main feature is the main menu where products can be added, edited, or deleted. The all-product menu contains various products that have been inputted and the quantity of each product still available. Next, the view all orders menu is a feature that allows.

Testing

admins to view orders that have been successfully placed or paid for, to proceed" with the next step, which is shipping. Finally, the theme menu is used to change the theme of the interface to dark or light mode. The dashboard menu can be seen in Figure 16.

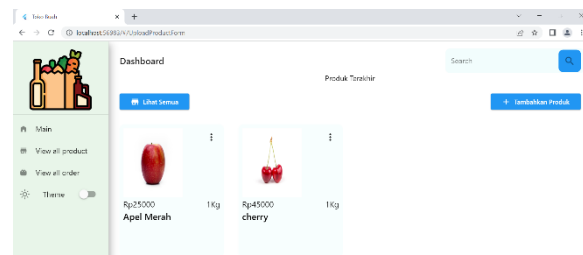


Figure 16. Display of the admin dashboard page

Next, the admin can edit products that need to be changed. The edited data will be saved in the Firebase database. The edit page can be seen in image 17.

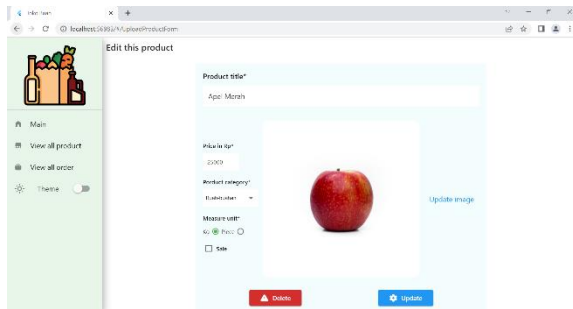


Figure 17. Display of the edit product page on the admin

Besides being able to edit or update product data, the admin can also view the data that is being ordered by users

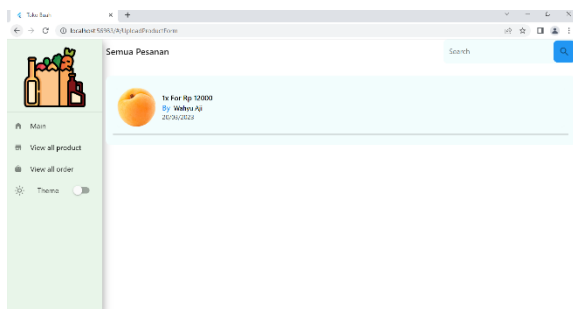


Figure 18. Admin order page display

The testing phase is a process to test whether the application is suitable or not for use by users or the public. From this testing, data collection or surveys were conducted from various segments of society through the distribution of questionnaires using Google Forms. The results from the distribution of questionnaires showed that many people supported the existence of the application despite its shortcomings. Moreover, the features in the application can function properly.

CONCLUSION AND RECOMMENDATION

The identified problem is that local and imported fruit sales still use a manual transaction system. This situation causes the effectiveness of transactions to be inadequate and difficult to bridge between transactions and buyers. Therefore, an electronic trading platform called Wein's Fresh Apps was created, designed specifically for Android users and using the prototype method and Firebase database as the basis for its development.

This application is designed to facilitate users in conducting online fruit trading transactions. With

Wein's Fresh Apps, users can easily sell and buy local and imported fruit products available in the online store. In addition, the Android-based mobile online store has many advantages, including ease of access and higher mobility, wider time flexibility, and a wider variety of product options.

This application aims to make it easy for users to sell and buy products in the online store. Android-based mobile online stores have many advantages for users, including ease of access and higher mobility, wider time flexibility, and a wider variety of product options.

RECOMMENDATION

Based on the research conducted, an evaluation of Wein's Fresh application is needed so that it can be further developed in the future by adding new, more advanced, and innovative features. In addition, this application also needs to be further developed using different methods, so that the research results produced can be more accurate and optimal. By conducting continuous evaluation and development, it is hoped that Wein's Fresh application can become a better and more useful electronic trading platform for users.

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