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DEVELOPMENT OF E-MARKETPLACE FOR MARKETING AGRICULTURAL PRODUCTS (CASE STUDY IN TUMARATAS VILLAGE)

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Abstract
Tumaratas is an agricultural village where most of the people's livelihood is farming. However, sales of agricultural products are still carried out traditionally and are tied to certain times, this can make it difficult for farmers and consumers to carry out the buying and selling process whenever they want. Limited market reach, farmers still rely on intermediaries or retailers so that products are only available in local shops or traditional markets, and do not reach consumers outside the area. E-Marketplace is an intermediary media that brings together sellers and buyers on the internet, helping sellers market and offer merchandise on the internet. The aim of this research is to build and develop an E-Marketplace for farmers as a forum for promoting and marketing their agricultural products and to make it easier for consumers to find the agricultural products they want. This e-Marketplace was developed using the PHP programming language with the Laravel framework and MySQL as the database. With the development of this E- Marketplace, it is hoped that it can help local farmers market their agricultural products and make transactions widely.
Keywords : Website, Agriculture, E-marketplace, Laravel, MySQL.

1. Introduction

Agriculture is a significant sector of the economy, in addition to providing income for farmers, it also triggers related sectors such as food processing and exports. The agricultural sector is still the mainstay of job creation in a fairly large number compared to other sectors in the economy in Indonesia[1]. Based on BPS (Central Statistics Agency) data, Indonesia's agricultural production increased 2.59% in the fourth quarter of 2021. Therefore, agriculture is the source with the greatest role in becoming one of the pillars of the economy. Indonesia has great potential in the agricultural sector with vast land and a variety of crops that can grow in the region. Most of the rural population makes agriculture their main source of employment, and the Tumaratas village community is no exception.

Tumaratas is a village in West Langowan District, Minahasa Regency, North Sulawesi. Tumaratas village is located at the foot of the Kelelondei Mountains which has a cool climate with an area of 923 hectares, 558 hectares of forest area and soputan mountains, and 263 hectares as a plantation area[2]. Therefore, Tumaratas village is an agricultural village where most of the people's livelihoods are farmers. For this reason, one of the important things to advance this potential is to increase community capacity for managing agricultural production and marketing. However, the sale of agricultural products is still done traditionally. Traditional sales are tied to specific times, such as store opening hours or market days, which can make it difficult for farmers and consumers to buy and sell products whenever they want. In addition, the limited market reach due to traditional sales means that farmers still rely on distributors or retailers so that products are only available at local stores or traditional markets, not reaching consumers outside the region.

E-Marketplace is one of the most widely used e-commerce platforms for online trading in Indonesia. E-Marketplace is an intermediary medium that brings together sellers and buyers on the internet. E-marketplace sites help sellers market and offer merchandise on the internet and become a third party in online transactions and payment facilities for buyers[3]. There are E-Marketplaces that are successful in connecting farmers and buyers, for example SayurBox and TaniHub.

Therefore, it is expected that the application of e-marketplace technology can be a medium for promotion and marketing of agricultural products, especially in Tumaratas Village. Helping farmers sell their products directly to consumers or other buyers so that they can get greater profits than relying on intermediaries.

2. Theorical Basis

E-Marketplace

Marketplace is a website-based online media where buyers and sellers conduct business and transactions[4]. The marketplace functions as a meeting place for buyers and sellers to trade goods and services, with market

management overseeing all transactions[5]. From some of these definitions, it can be concluded that a marketplace is an electronic or internet-based market (website-based) that is used to conduct transactions or business activities between buyers and sellers.

Website

Website is an internet facility that connects documents locally and remotely. Documents on the website are called web pages and links on the website allow users to move from one page to another (hypertext), either between pages stored on the same server or servers around the world. Pages can be accessed and read through browsers such as Google Chrome, Mozilla Firefox, and others [6]. A website is a page of information provided through the internet so that it can be accessed worldwide as long as it is connected to the internet network. A website is a component or collection of components consisting of text, images, sound, and animation so that it is interesting to visit[7].

Laravel

Laravel is a web application framework with expressive, elegant syntax. Laravel aims to make it easier for developers without sacrificing the functionality of an application[8]. Laravel is an open source PHP platform that is stable and easy to understand and widely used around the world. It follows the model-view-controller style pattern. Laravel uses current components from various frameworks that help build web applications. Therefore, web applications are designed to be more organized and pragmatic.

PHP

PHP is a common server-side scripting language that we can use to develop dynamic websites and applications. PHP only needs to be installed on the web server that will host the web application and client applications can access server resources through a web browser[9]. Another benefit that comes with the PHP language is that it is a server-side scripting language. PHP is a cross-platform syntax which means it can deploy applications on a number of different operating systems such as windows, Linux, Mac OS etc.

XAMPP

XAMPP is open-source software developed by Apache Friends. The XAMPP software package contains the Apache 4 server distribution of Apache, MariaDB, PHP, and Perl. And it is basically a local host or local server. This local server works on a desktop or laptop computer. The use of XAMPP is to test clients or websites before uploading them to a remote web server. This XAMPP server software provides a suitable environment for testing MYSQL, PHP, Apache, and Perl projects on a local computer[10]. The full abbreviation of XAMPP is X stands for Cross-platform, (A) Apache server, (M) MariaDB, (P) PHP, and (P) Perl. Cross-platform usually means that it can run on any computer with any operating system.

Visual Studio Code

Visual Studio Code is a code editor application made by Microsoft that can be run on all desktop devices for free. The completeness of features and extensions makes this code editor the top choice of developers. Visual Studio Code even supports almost all operating systems such as Windows, Mac OS, Linux, and so on.Visual Studio Code offers a fairly broad extension and ecosystem. This makes it highly compatible with other languages or runtime environments, including Python, PHP, .NET, and Java.

Bootstrap

Bootstrap is an HTML, CSS, and JavaScript-based web development framework designed to design and speed up the responsive web development process. Besides being able to be used to develop websites faster, Bootstrap is a free framework that is open-source. The scripts and syntax provided by Bootstrap can be applied to various components in web design. Bootstrap consists of a collection of syntax compiled in three main files: Bootstrap.css, Bootstrap.js, and Glyphicons. Keep in mind that Bootstrap requires a JS library called jQuery to run plugins and JS components.

3. Research Methodology

Research Flow Chart

The following is a flow chart of this research

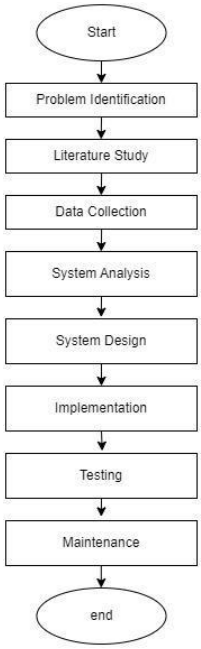


Figure 1. *Research Flow Chart*

Data Collection Technique

1. Data Observation
   Make direct observations of the object to be studied. To obtain relevant website research data according to needs, researchers have made direct observations on Tumaratas village farmers.
2. Literature Study
   Collecting theories and previous research related to application development from books, articles, and journals.
3. Interview
   The interview method is a data collection technique where the researcher directly dialogues with the respondent to obtain information from the respondent. This method was carried out by means of direct questions and answers between researchers and several farmers in Tumaratas Village to seek information about the problems experienced by farmers in Tumaratas Village. The main problem encountered is that farmers still experience difficulties in selling their agricultural products.

Research Methods

In the E-Marketplace Marketing of Agricultural Products that researchers build this uses the waterfall system development method. The waterfall method is a systematic, sequential system development model. The waterfall method has the following stages:

1. Requirements Analysis

   At this stage the researcher must know all the information regarding the user's needs for the system. By collecting data, namely observations, literature studies and interviews with related sources, namely farmers, regarding what kind of system is needed, the problems experienced by farmers.

2. System Design

   This process is a continuation of the Requirements Analysis process, which presents the design required by the user which will later be implemented into a programming language. To find out the flow, researchers make an initial design of the application in the form of database and system design, and design of input or output from the system. The design will be explained in detail using UML diagrams. Use Case Diagram to present a system created based on functionality requirements. Activity Diagram to present a system based on the activities carried out. Sequence Diagram to present processes in the system to access one function. Class Diagram to present a database built in the system.

3. Implementation

   The system that has previously been designed is translated into a program so that it can later become an e-marketplace website. The developer uses PHP version 8.2.4, MariaDB version 10.4.28 for the database, the writer uses PhpMyAdmin version 5.2.1 which is found in XAMPP version 3.3.0. The writer also uses Visual Studio Code as a text editor to manage coding, Laravel version 10.48.5 as a framework and Google Chrome as a web browser. For the interface the writer uses Bootstrap version 5.3.3.

4. System Testing

In this fourth stage, an inspection and testing of the system as a whole is carried out to identify possible failures and errors in the system. This system will carry out testing using the black box testing method. Black box testing aims to test the system by observing the results of execution or system output through test data and checking software functionality.

5. Maintenance

This researcher will carry out maintenance on the e-marketplace system by periodically checking the data in the software.

System Design

In the design stage, displays the initial design of the application in the form of database and system design, and the design of the input or output of the system. The design will be explained in detail using UML diagrams. Use Case Diagram to present a system that is made based on functionality requirements. Activity Diagram to present a system based on the activities performed. Sequence Diagram to present the process in the system to access one function. Class Diagram to present a database built in the system.

1. Use Case Diagram

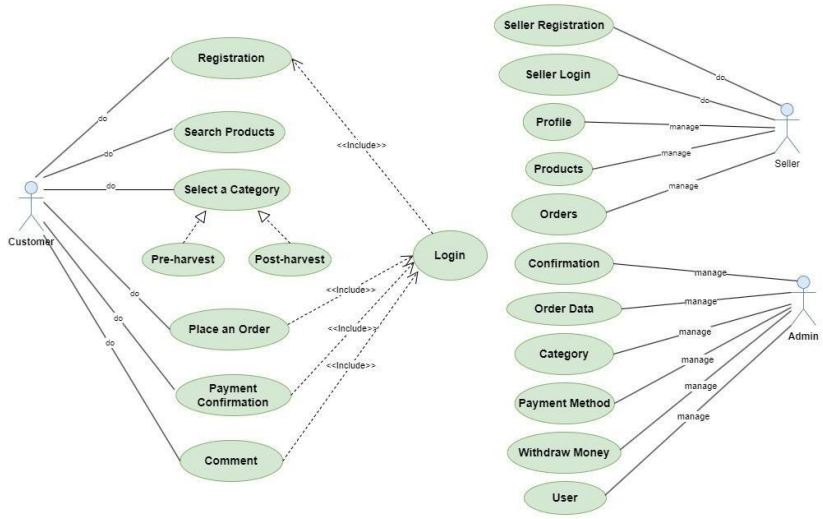


Figure 2. *Use Case Diagram*

2. Activity Diagram

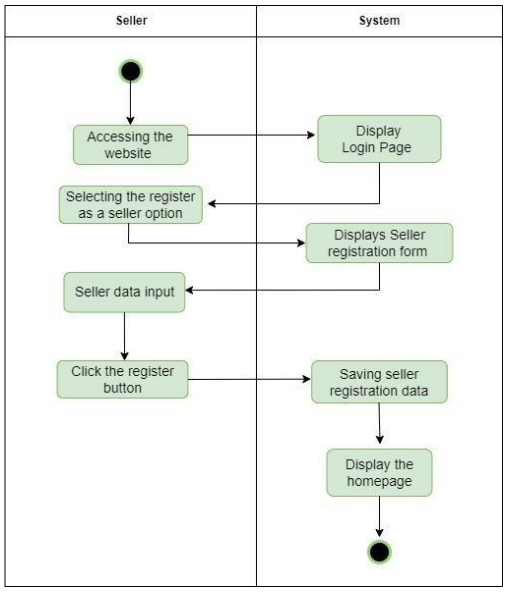


Figure 3. *Activity Diagram Seller Registration*

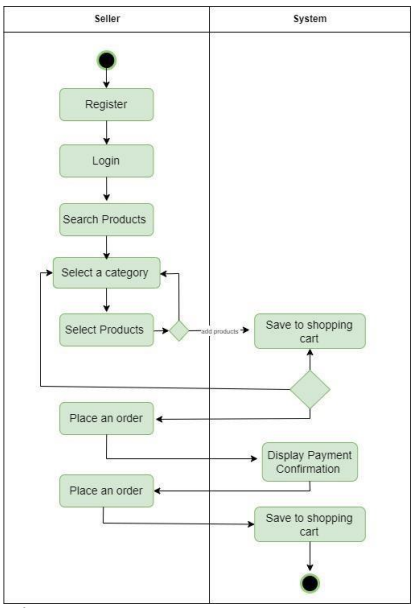


Figure 4. *Activity Diagram Customer*

3. Sequence *Diagram*

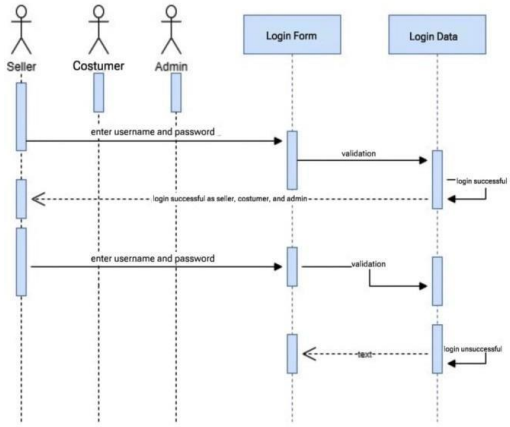


Figure 5. *Sequence Diagram Login*

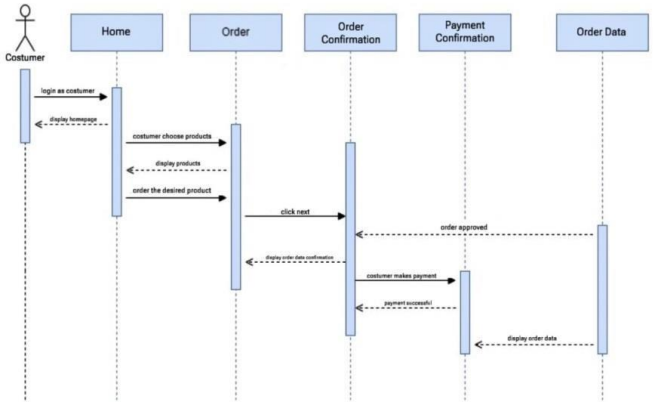


Figure 6. *Sequence Diagram User Order*

4. Class Diagram

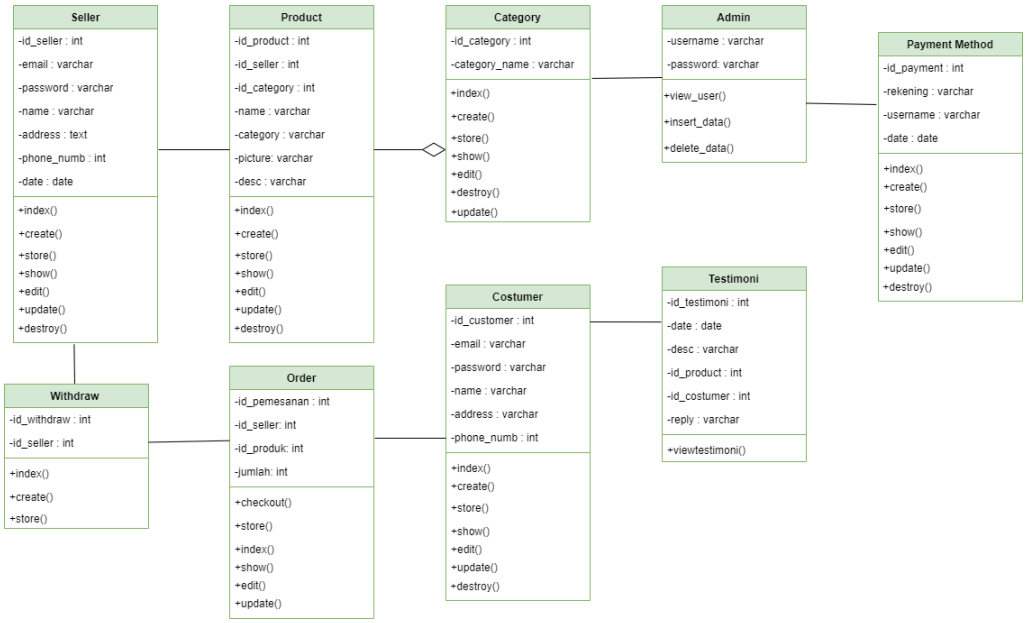


Figure 7. *Class Diagram*

4. Research Results

Requirements Analysis

Functional requirements:

Functional requirements are the system's ability to carry out processes and display any information.

1) The system can log in as seller, customer and admin.
2) The system is able to display product information in the form of images, prices and product details.
3) The system can place product orders.
4) The system is able to manage; add, delete, and edit products as a seller.
5) The system is able to manage orders, categories, payments and seller data as admin.
6) The system is able to manage user data

Non-Functional Requirements:

Apart from functional needs, non-functional needs are also needed to support this marketplace application, namely

1. Operating System

In the internet world, whatever operating system is used by the client and server to communicate will not be a problem for both of them, both can communicate as long as they use the same protocol, the protocol used to access a web is the http protocol (Hypertext Transfer Protocol).

2. Web Server
   The web server that will be used in creating this system is Apache.
3. Web Browser
   This web browser will be used to display web pages so that they can be accessed by users. The web browser must support the http protocol. The web browsers used are IE, Mozilla Firefox, Opera, Google Chrome.
4. Editors
   The editor is the most important factor in designing a website, the editor used is Visual Studio Code.

Implementation

The implementation stage is the final stage in describing the system, namely placing the system so that it is ready to operate. Implementation is useful for making it easier to implement the system that has been prepared so that data entry leads to the presentation of information in accordance with planned procedures.

1. Main Page
   The initial display that appears for the first time when we access the system will display a display like Figure 8.

Figure 8. *Main Page*

2. Login Page
   The following is a display of user login..

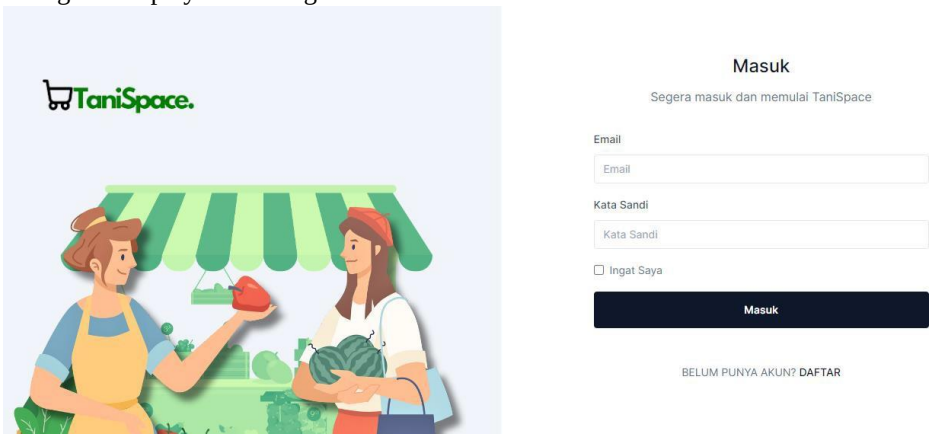
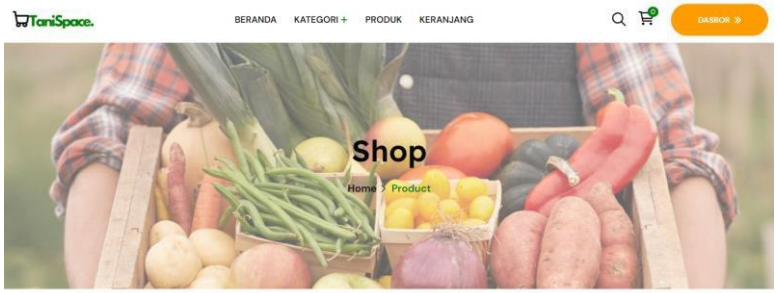


Figure 9. *User Login*

3. Product Page
   On this page, customers can see the various products available.



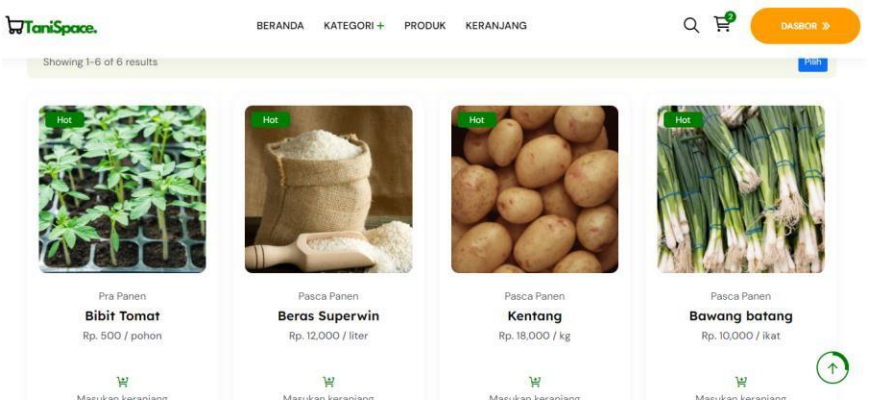


Figure 10. *Product Page*

4. Cart Page

After selecting a product, customers can add the product to the cart and then it can be processed for checkout**.**

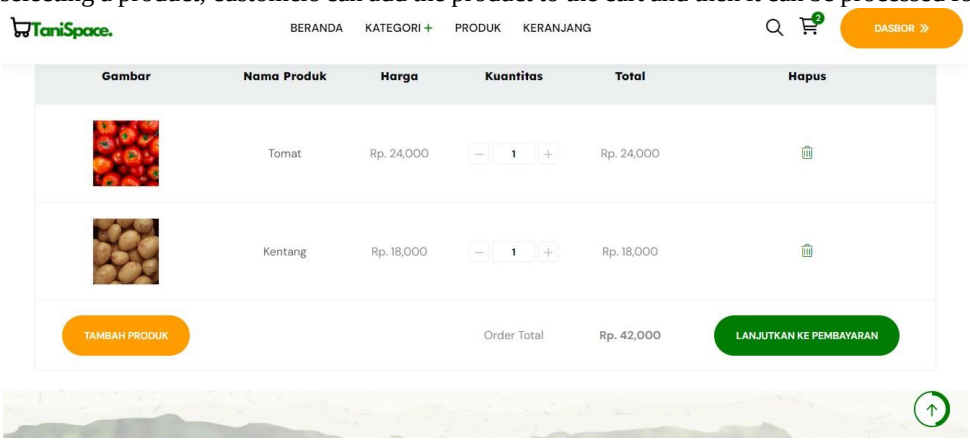


Figure 11. *Cart Page*

5. Checkout Page

To checkout, on this page customers will fill in the type of payment method, proof of payment, desired type of delivery, and address details.

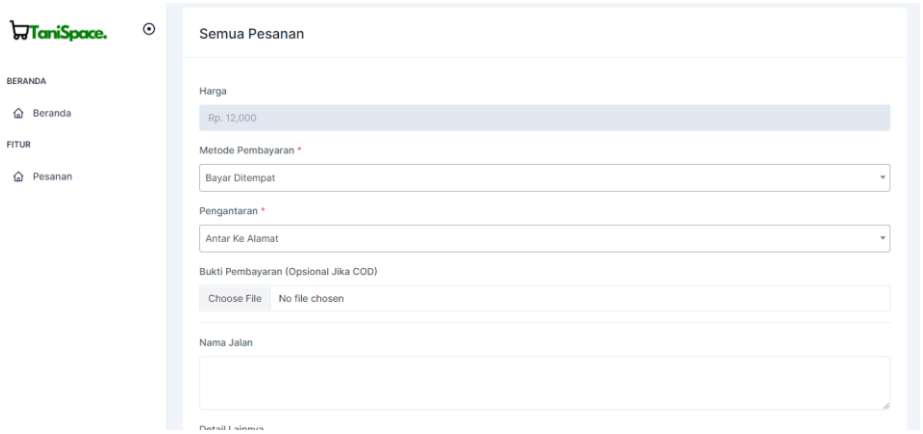


Figure 12. *Checkout Page*

6. Order Page

On this page, customers can see their order data and delivery status and can comment when the order process is complete.

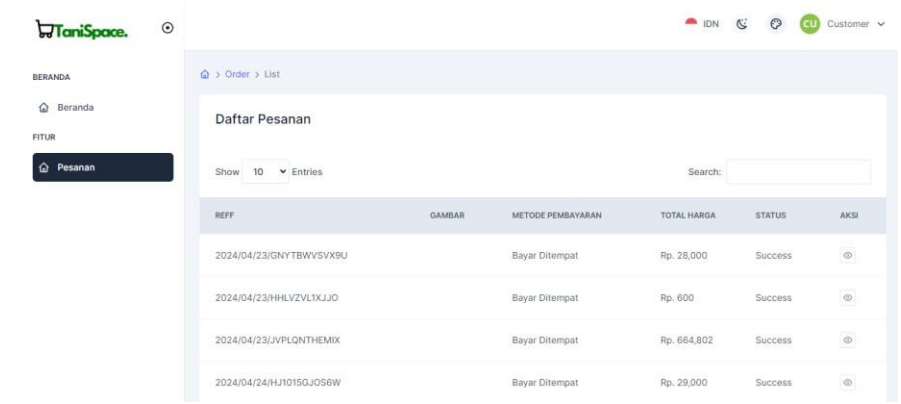


Figure 13. *Customer Order Page*

7. Seller Manage Product Page
   On this page, sellers can manage the products they want to sell. Can be seen in Figure 14

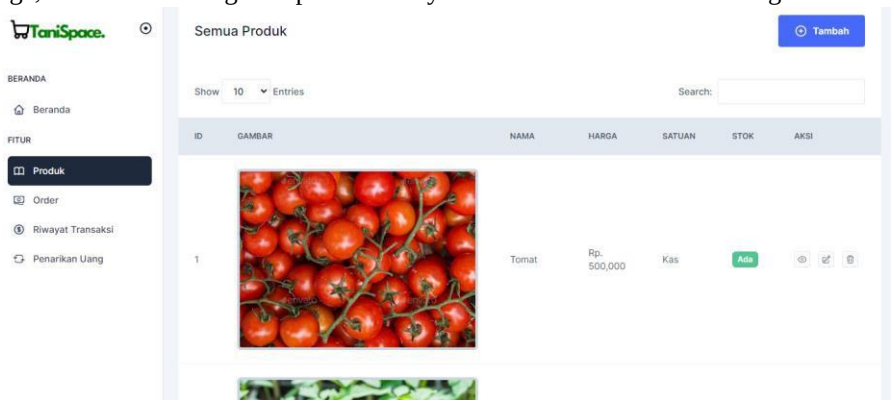


Figure 14. *Manage Product Page*

8. Manage User Page
   On this page the admin can manage users. Admin can view, edit and delete users.

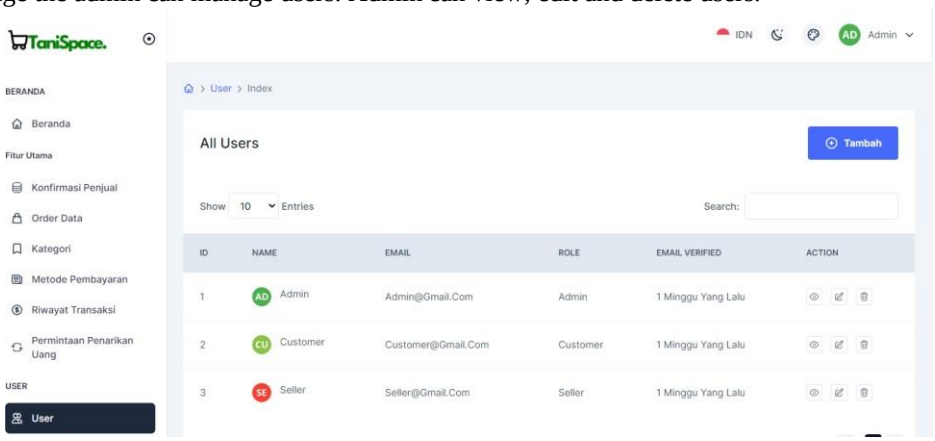


Figure 15. *Manage User Page*

5. Conclusion

Based on the results of testing and discussion that has been done, it can be concluded that the development of E-Marketpalce for marketing agricultural products was successfully made. This E- Marketplace system can carry out the product ordering process and can be a medium of promotion and transactions between buyers and farmers, especially in the Tumaratas village.

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