



## Application for Marketplace Agricultural Product

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### ABSTRACT

Farmers empowerment is an effort to improve farmers' ability to conduct better farming through education and training, counseling and mentoring, development of Agricultural products and marketing system, consolidation and guarantee agricultural land area, ease of access of science, technology and information, and institutional strengthening. Support Information Technology is not only making it easier regarding resources but become media marketing agricultural products for farmers in Indonesia. Currently, the chain of commerce for the sale of agricultural products is still very long. That causes the price of agricultural products is quite high. However, when the farmers sell the product, the hat price is still relatively low. To reduce the chain of commerce is needed a system that can provide information as well as a marketing place for agricultural products and can also use for direct purchase by consumers. The system that can meet those needs is e-commerce that built Marketplace based. Based on the findings of e-Marketer, the business to consumer (B2C) e-commerce market in Indonesia has the largest growth record in the Asia Pacific through 2017. There is potential to improve the welfare of farmers in Indonesia using information technology for marketing as well as direct transactions with consumers. In this paper will be proposed Android Application for Marketplace Agricultural Product Base Android. This Application will development by Software Development Life Cycle (SDLC) Prototype method with Java and XML programming languages and database management will be used MySQL. This Application will provide information on agricultural products, facilitate farmers to market their agricultural products, and facilitate farmers to conduct direct transactions with consumers.

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## 1. Introduction

Farmers empowerment is an effort to improve their ability to conduct better farming through education and training, counseling and mentoring, development of Agricultural products and marketing system, consolidation and guarantee agricultural land area, ease of access of science, technology and information, and institutional strengthening. Information Technology supported not only makes it easier regarding resources but also become media for marketing agricultural products for farmers in Indonesia [1].

At Indonesia, the process of agricultural marketing, Farmer must go through six (6) to seven (7) chain trading system for the results of their farm to consumer. The links include Farmers, Small Wholesalers, Large Wholesalers, Mother Market, Brokers, Traditional Markets and Vegetable Traders. That is causes a significant price difference from farmers to consumers. Also, other issues are the difficulty farmers promote the sale of their farm as an alternative other than to Wholesalers. Some of the problems faced by farmers in Indonesia to market their agricultural products [2].

1. Availability of goods that are seasonal,
2. Long marketing chain,
3. The lack of market information network.

Farmers are facing some problems to market their agricultural products, among others [3].

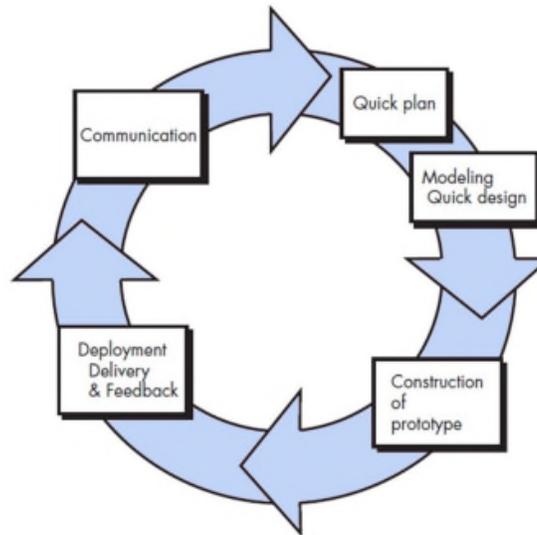
1. production continuity;
2. the length of the marketing channel;
3. inadequate market;
4. lack of market information;
5. low bargaining power;
6. price fluctuation;
7. poor quality of production;
8. lack of clarity of marketing network; and
9. the low quality of human resources.

To reduce the chain of commerce is needed a system that can provide information as well as a marketing place for agricultural products and can also use for direct purchase by consumers. The system that can meet those needs is e-commerce that built Marketplace based. Based on the findings of e-Marketer, the business to consumer (B2C) e-commerce market in Indonesia has the largest growth record in the Asia Pacific through 2017 [4]. There is potential to improve the welfare of farmers in Indonesia using information technology for marketing as well as direct transactions with consumers. In this paper, we proposed an Application for Marketplace Agricultural Product Base Android. This Application will development by Software Development Life Cycle (SDLC) Prototype method with Java and XML programming languages and database management will be used MySQL.

## 2. Research Methodology

Our research follows the Software Development Life Cycle (SDLC) Prototype can be seen in Figure 1 [5].

1. Communication. Communication between the developers with clients to gather requirements to form the overall purpose of the software. At this stage, interviews were conducted with some farmers in Pangalengan. At this stage, the marketing business process is produced by the farmers and the problems faced by farmers.
2. Quick Plan. The quick plan focuses on the presentation of software aspects that will be visible to the client. At this stage do a search reference that can strengthen the needs of applications to be built. Then translated into needs that can be implemented in the application.
3. Modeling and Quick Design. At this stage of translation needs to be obtained from the previous stage into models and designs on which the construction of prototypes using the Flow Map, Use Case, ER-diagram, and Mockup to produce a draft for the construction of prototypes.
4. Construction of Prototype. At this stage, the development of a prototype based on the needs that have been defined previously. Prototype development covers the appearance, functional requirements until the application by design.
5. Deployment Delivery and Feedback. At this stage, the implementation of the prototype is done in the real environment or can be called as a trial and submit prototype to the client to be evaluated to get any shortcomings or add features which should be added to the application.



**Figure 1.** Software Development Life Cycle (SDLC) Prototype [5]

### 3. Related Work

A web-based agricultural information marketing system will make it easier for farmers to sell their crops so that farmers will save more time and expense to get traders who will buy the crops that they plant and can better assist the village government in farmers welfare the village. The online marketplace is born from the problems of farmers who are difficult to market their agricultural products. Even that often happens, the middlemen play the market price. Farmers hard to access to sell their commodities, so many emerging middlemen who incriminate farmers. Middlemen have also dominated the market. In the current era of technology, the website is one of the innovations that can be used to help farmers market their products. Agricultural innovation is indispensable, especially to meet the current

digital era. It is time for people to realize that agriculture is broad, not just hoeing and planting seeds [6].

E-Commerce based e-Commerce system can be used as an alternative for farmers, used as a media campaign, communication and information and can cut the distribution chain of agricultural products marketing. The benefits felt by farmers and consumers, directly and indirectly, give a positive influence. Especially from the broader marketing channels of agricultural products can increase product demand and spur the procurement of production among farmers and also the price offered to consumers will be cheaper so that sales of agricultural products can be more increased and profitable for farmers [7].

Along with the development of information technology that may lead to mobile-based technology to support the application of ICT in the agricultural sector, the recommended application platform to develop is web-based and mobile platforms. Flexibility mobile applications have proved capable of bridging the users in this case farmers with various parties. The availability of smartphones is also widespread at affordable prices [8].

The phenomenon that is often experienced by farmers is when farmers experience the harvest season then the crop has a low price compared to the price when not in the harvest season. That causes the income of farmers was not optimal. With digital-based sales media, farmers can offer their products directly. By offering agricultural products through the marketplace are expected buyers of agricultural products not only local buyers, but buyers can come from other regions or nationally and even internationally [9].

#### 4. ICT in the Farming Cycle

From a farmer perspective, the cropping cycle typically goes through three stages as shown in Figure 2: Pre-cultivation, including crop selection, land selection, calendar definition, access to credit, etc. Crop cultivation and harvesting, including land preparation and sowing, input management, water management and fertilization, pest management, etc. Post-harvest, including marketing, transportation, packaging, food processing, etc. [10].

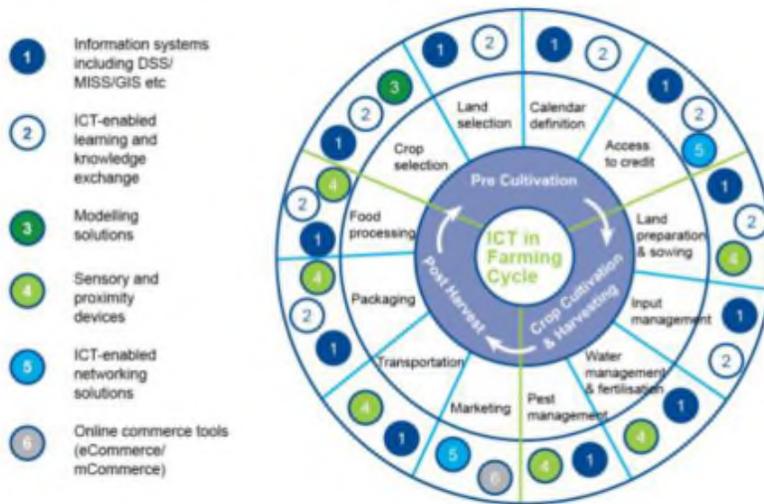


Figure 2 Information and services requirements for different stages of crop lifecycle [10]

## 5. Analysis and Design

This stage is a design process of the application to be built. At this stage, the need for which has been analyzed drawn into the design. At this stage, the design is built in the Entity Relationship Diagram, Use Case Diagram, and interface design.

### 5.1. Comparative System Analysis

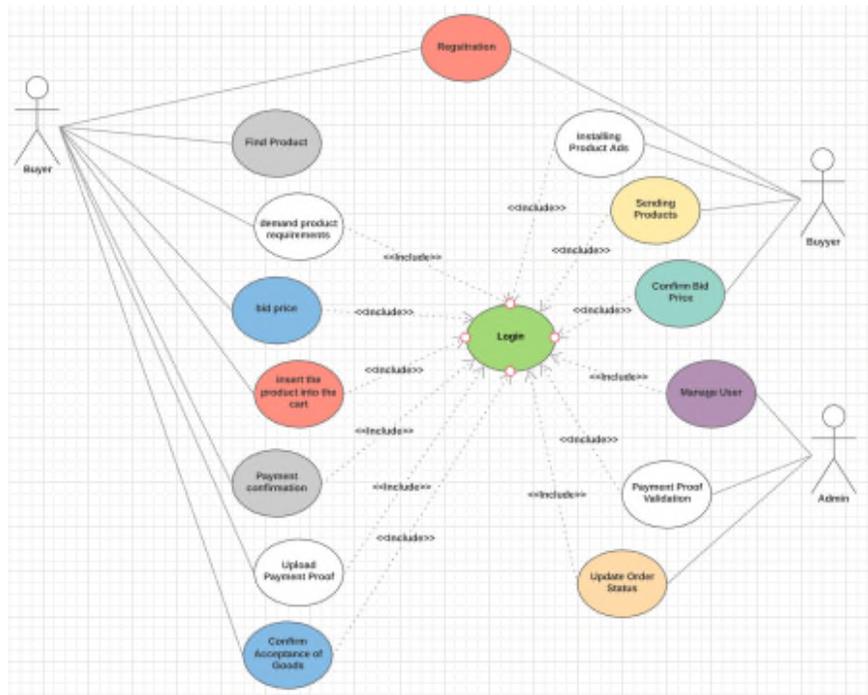
In the development of this application performed the comparison of similar applications. Comparison of this application aims to find features that do not exist in other applications so that it can be implemented on the application to be created. Comparison of similar applications can be seen in the following Table 1.

**Table 1.** Comparison of similar applications

No	Main Function System	Sikumis.com	Limakilo.id	Application for Marketplace Agricultural Product
1.	Assist farmers in marketing and selling their agricultural products	×	×	√
2	Assist in looking at available commodities	√	√	√
3	Use the bargaining system and standard price	√	×	√
4	Posting the advertising needs for commodities	√	×	√
5	Payment is made through the application	√	×	√

### 5.2. Use Case Diagram

Diagram Use Case for Agricultural Marketplace application in Figure 3 is defined by three (3) role namely seller, consumer and administrator and have 13 main functionalities. Here is Use Case Diagram of Agricultural Marketplace application.



**Figure 3** Use Case Diagram

### 5.3. Entity Relationship Diagram

Entity Relationship (ER) Diagram is used to model the application database at the logic level or at the concept level. The following is the Entity Relationship Diagram on the Agricultural Marketplace application as shown in Figure 4.

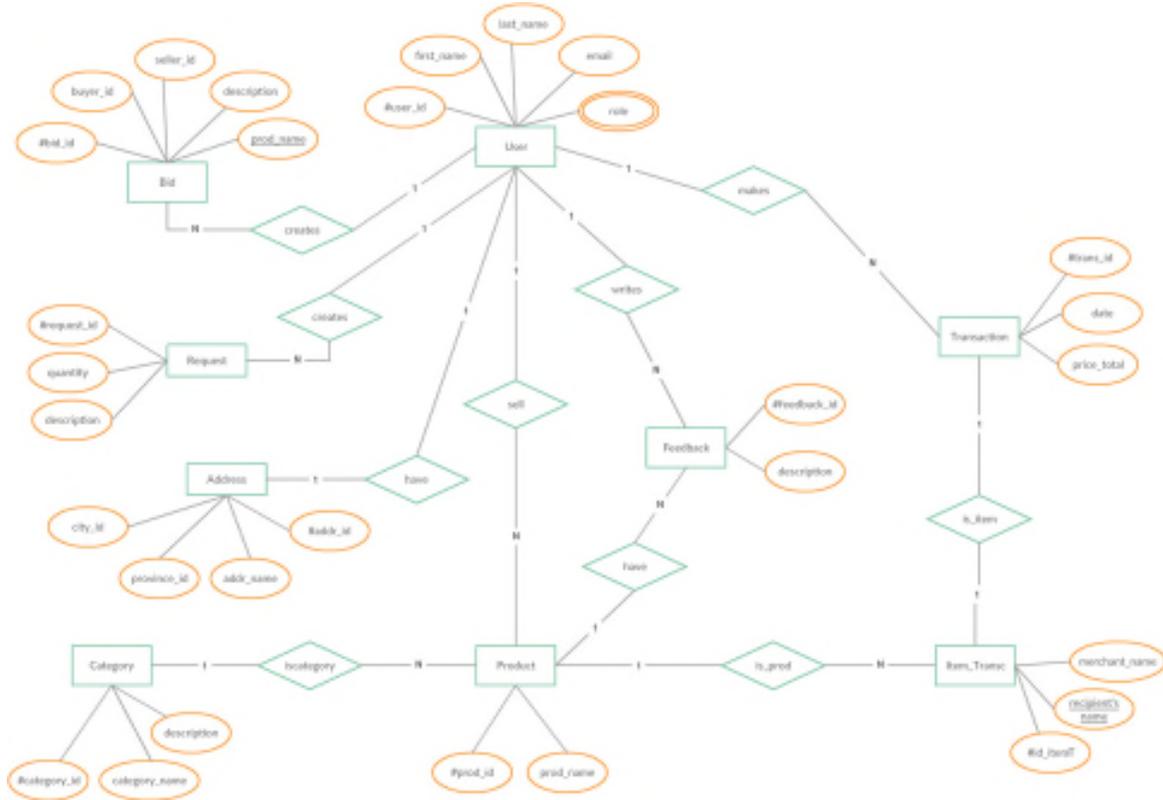


Figure 4. ER Diagram

### 6. Implementation

This app was created using Android Studio 2.2.3 using Java and XML programming language and CodeIgniter framework that discusses PHP as a link between Android with MySQL database or better known as Application Programming Interface.



Figure 5. Home page

## 6.1. Home Page

This view is a product image slider, promo product, product selection and product tab based on categories. There is also a Drawer Navigation Menu (Side Menu) which will open when users swipe from left to right as shown in Figure 5.

## 6.2. Home Page for Buyer

The buyer's page in the app as shown in Figure 6 consists of:

1. Login and Contact Us page. The login page is used by the user when logged in to the app. The contact us menu contains contact information.
2. Buyer Registration page. This page is for users who want to buy products in the App. This page is complete with the user's address.
3. Home Page for Buyer. This Homepage will open the first time after the splash screen, is the core page of the buyer. Has a function to view, search, and buy products. On this page, there is a Drawer Menu that becomes the storage submenu to buyers.
4. Sell Products. This page is for users who want to be a seller in the app. There is a button that connects or moves the page to the seller's registration page.
5. Request Products. This page works for buyers who want to ask the seller to sell the desired product if the application does not exist yet.
6. Basket Page. This page will appear when the user (buyer) selects a trolley-ticked button or shopping cart. Contains about what items will be purchased and total bills but not included.
7. Checkout Page. The page that will appear after the "Continue Payment" button on the cart page is selected. Contains a form with the recipient's name, address and delivery method.
8. Checkout Validation Page. This page serves to double check the insert results from the Checkout page.
9. Billing Details page. Pages showing transaction codes and payment codes. The payment code is on the last three (3) digits of the total bill that must be paid.

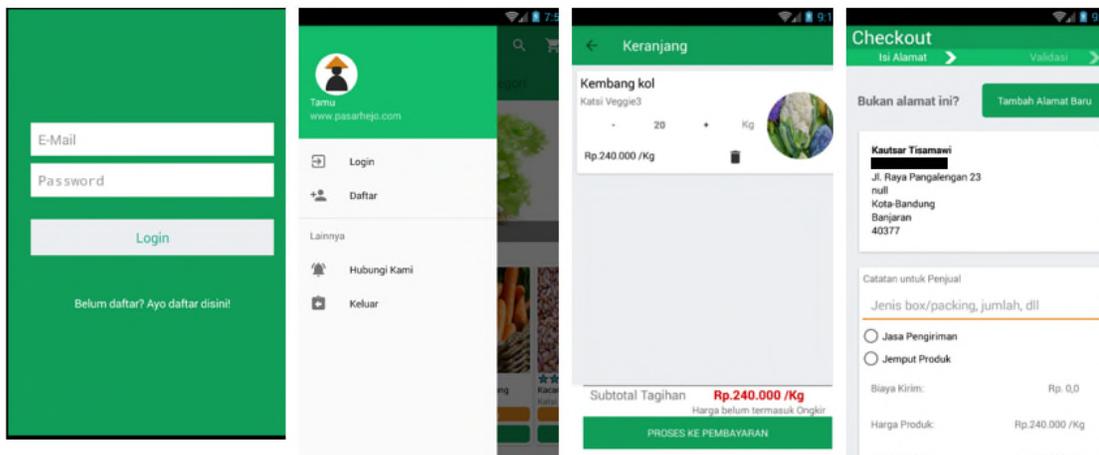


Figure 6. Home page for buyer

### 6.3. Home Page for Seller

Homepage for the user who is the seller of the app as shown in Figure 7 consists of:

1. Seller Registration page  
This page is for users who want to sell products in the App. This page is complete with the seller's address.
2. Seller Home page  
It contains profiles from sellers and there are buttons for selling or registering products into the app.
3. Product Registration Page  
This page serves to register the product on the application so that it can be seen on the buyer's page or simply to create a product ad. Contains photos of products, categories provided by the app.
4. Shipping Service Page  
This page serves to enable any delivery service that the seller wants.
5. Account Page and Account Input  
This page serves to display accounts that have been entered by the seller.
6. Seller Profile Page  
This page shows the seller's profile details as well as displays the number of products sold, the number of transactions and the number of incoming reviews.
7. Seller Offer Page  
This page shows a list of offers made by Buyers. There are two actions that can be done on this page: confirm the offer and remove the offer which means the offer from the buyer is rejected.
8. Seller Request Page  
This page serves to display a list of requests made by Buyers. The data will be based on the categories provided by the Application.
9. Seller Order Page  
This page serves to display a list of orders that have been in the message by the Buyer. There are several actions that can be done such as viewing order details, rejecting orders, and rejecting orders.
10. Seller Order Details page and Input Proof of Payment  
This page serves to see buyer order details such as product quantity, transaction code, and shipping address. While Input Proof of payment serves to send proof of payment to Admin for the validation.
11. Transaction Page  
This page serves to store transactions that have been or are being done by the buyer. Contains product details as well as delivery and payment status.

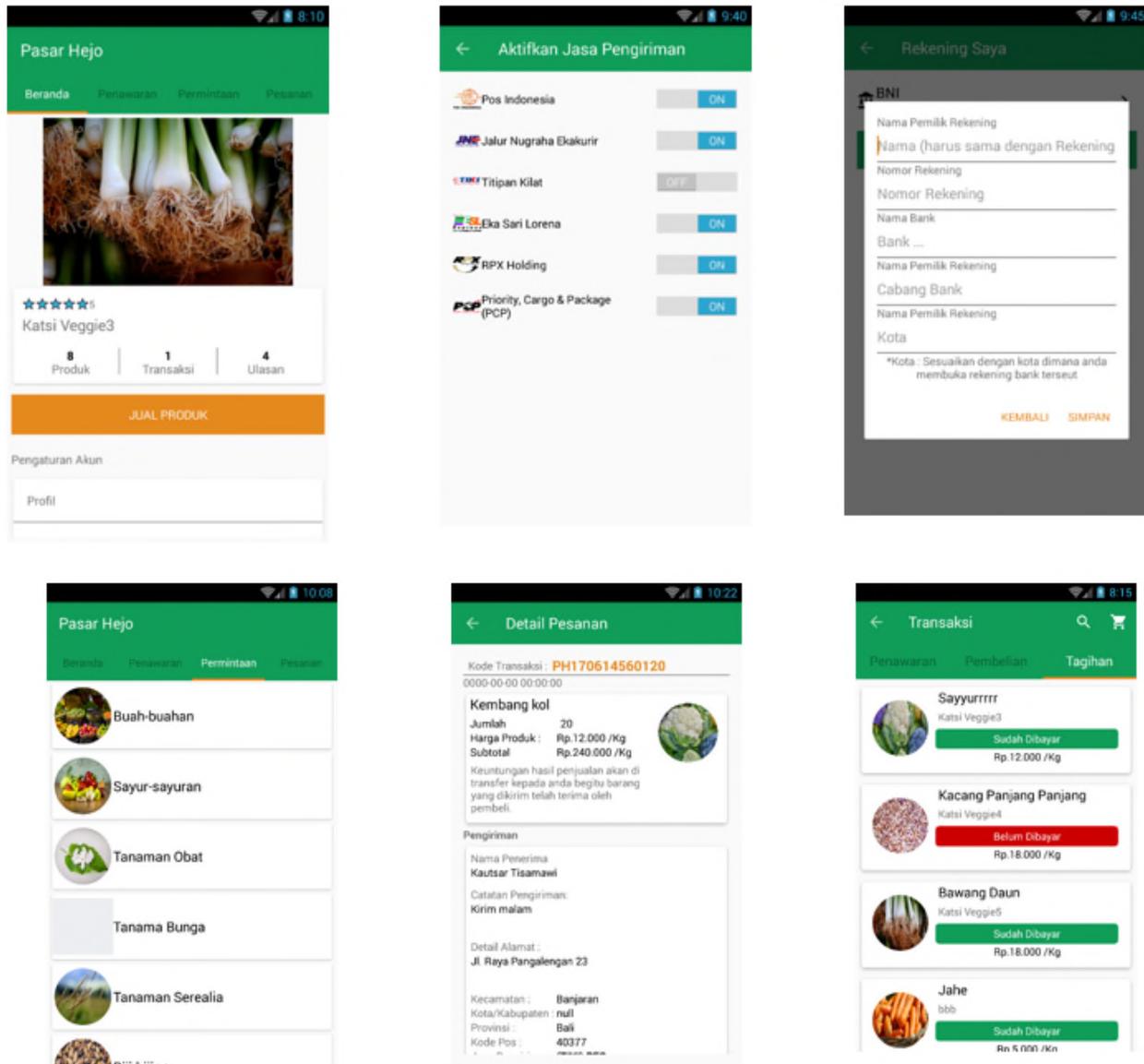


Figure 7. Home page for seller

## 7. Conclusion

Based on the purpose of development of Application for Marketplace Agricultural Product, it can be concluded as follows.

1. Application for Marketplace Agricultural Product facilitate Farmers to market their products quickly and efficiently.
2. Application for Marketplace Agricultural Product facilitate Buyers who are looking for vegetables or fruits that are sold in Indonesia.
3. Transactions between Buyers and Farmers become easier and faster.
4. Communities who have installed Application for Marketplace Agricultural Product can see products sold by Farmers wherever they are located, so they can reach more Buyers.
5. Application for Marketplace Agricultural Product has an easy bargaining feature and has a review of the products purchased.

6. Application for Marketplace Agricultural Product gives a sense of security when making transactions because the money from the buyer will be accommodated first and then will be given to the farmers after the products sent by the Farmers.

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