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YUK TANI: OPTIMIZING THE DISTRIBUTION OF AGRICULTURAL PRODUCTS THROUGH ANDROID-BASED APPLICATIONS

Chaulina Alfianti Oktavia[1]*, Firda Meisaroh[2] Rizky Abdillah[3]

[1]Information Systems, Informatics Engineering, STIKI Malang
[2]Digital Business, National Institute of Technology Malang
[3]Indonesian College of Informatics and Computers, Malang

E-mail: *chaulina@stiki.ac.id[1], firda@lecturer.itn.ac.id[2]

Abstract

The Pajarakan District area is an agricultural area where 61% of the area is rice fields. Even though the Pajarakan Subdistrict area has large agricultural land, it does not make farmers feel benefited when the harvest season arrives, because many of the farmers feel at a loss because their crops are bought by collectors at low prices. The purpose of this research is to create a system for selling agricultural products to help farmers sell agricultural products directly to agents in order to get a higher price than the price of collectors. In this study, a system was successfully created with the name YUK TANI based on Android using Android Studio, and the CodeIgniter 4 framework for creating REST APIs, and MySQL as database storage. With this system of selling agricultural products, it is hoped that it can help farmers in the Pajarakan District area to improve their economy when post-harvest arrives.

Keywords: *Digital Business, Android Application, Interface Design, Distribution*

1. INTRODUCTION

Agriculture is a human activity consisting of farming, raising animals including fish, and also forestry. Farmers are workers who raise plants or animals that are bred for their use in order to gain profits as food, industrial raw materials and also energy sources. Basically, agricultural business is a community economic activity that requires basic knowledge for managing a business premises, selecting seeds, and also marketing [1]. Resource availability, geography and climate, social and economic pressures, farming culture, philosophy, and politics all play a role in determining the cropping systems in each agricultural region. Usually people view agricultural businesses as agribusiness. Agriculture is one of the most important jobs considering that all basic human needs as a source of daily life are obtained from the agricultural sector, for example, staple foods that are often found throughout Indonesian society, especially in the Pajarakan District area, are rice and chilies which make market demand increase. .

The Pajarakan District area is a sub-district in Probolinggo Regency which has a strategic area and fertile land considering that the number of rice fields in Pajarakan District in 2018 according to BPSKab (Probolinggo Regency Central Statistics Agency) is around 61 percent of the total area. This figure is quite high because Many people in Pajarakan District work as farmers or farm laborers [2]. The highest income from the agricultural sector in the Pajarakan District is from cayenne pepper, tobacco, and the one with the highest selling price is shallots. Even though the Pajarakan District area is an area that has a lot of rice fields, it doesn't make many farmers feel at a disadvantage when the harvest season has arrived, because many of them feel at a loss because their harvest is sold at a much cheaper price than the real market price, there is a lot of hoarding. Unsold harvests are also a factor in farmers' losses when post-harvest season arrives. As a result of these losses, many farmers are confused and confused about turning around their economy because there is no capital that they can use to replant the rice fields they own.

After conducting a survey of 19 farmers, it was found that 15 farmers experienced losses in Selogudig Kulon Village and Selogudig Wetan Village, as many as 79% said that their agricultural products were sold to collectors who in fact the collectors bought agricultural products at prices much cheaper than the price. which is determined by the agent, and the farmers who sell do not know the latest developments in market prices that have been set by the East Java government, but only know information about market prices through collectors, which is why many farmers in Pajarakan District sell their agricultural products to collectors. The difficulty for farmers to contact collectors is also the reason why the agricultural products they harvest are not sold for a long time, which will cause the agricultural products to rot and as a result cannot be sold.

2. RESEARCH METHODS

A. Research Location and Time

The qualitative research methods used in this research are field notes, interview transcripts, photos or drawings, video recordings, and so on, all of which can be used to produce descriptive data for qualitative research. The approach chosen is a case study. Where researchers carefully analyze a program, activity, event, process or group of individuals. This research took place from April to May 2022 in two villages in Pajarakan District, Probolinggo Regency, namely Selogudig Kulon Village and Selogudig Wetan Village. Researchers conducted interviews and observations with agents and several farmers whose fields were experiencing the harvest season, because it is during the harvest season that farmers sell their agricultural products to collectors.

B. Likert Scale

The Likert scale is a scale used to measure the attitudes, opinions and perceptions of a person or group of people about social phenomena. For each answer choice a score is given, the respondent must describe whether they support the statement (positive) or do not support the statement (negative) [8].

The Likert scale is used with the following value weights:

1) Highly Unsuitable (STS)
2) Not Compliant (TS)
3) Fairly Appropriate (N)
4) Compliant (S)
5) Very Suitable (SS)

Calculation of the total score using the following formula:

$$\sum \textbf{skor total} = (\textbf{Rt} \times \textbf{STS}) + (\textbf{Rt} \times \textbf{TS}) + (\textbf{Rt} \times \textbf{N}) + (\textbf{Rt} \times \textbf{S}) + (\textbf{Rt} \times \textbf{SS})$$

Information :

1) **Total Score:**Total score from the sum of respondents with each value weight.
2) **RT :**Number of respondents.

After calculating the total score, it is necessary to get the expected score or ideal value. The expected score is the maximum score between the number of respondents and the weighted value. So we get the following formula:

$$\sum \textbf{Skor kriterium} = \textbf{n maksimal} \times \textbf{Rt}$$

Information :

1) **Criterion Score:**Expected score (ideal score) per question.
2) **n maximum:**Value weight.
3) **RT :**Amount of resp

And to find out which interval the score index is in, you need to calculate the interval scale as follows:

$$\textbf{I} = \frac{\textbf{100}}{\textbf{jumlah skor (skala likert)}}$$

Information :

1) **I:**Intervals
2) **100 :**Constant 100 (Means 100%)
3) **Total score :**The total score on the Likert scale is five (5)

So, the interval values obtained are as follows:

$$\textbf{I} = \frac{\textbf{100}}{\textbf{5}}$$

$$\textbf{I} = \textbf{20}$$

Based on the calculation above, an interval value of twenty (20) is obtained. The lowest interval value is equal to zero (0) and the highest is one hundred (100) in percent units [9]. So the interval value is described as follows:

1) **Figure 0% - 19.99%** **:**Very less
2) **Figure 20% - 39.99%** **:**Not enough

3. ANALYSIS AND DESIGN

A. Interface Design

Interface design is a design that focuses on the appearance of a program before the program is created.

Figure 10. Splash Screen Design

The design in Figure 10 above is a splash screen page which is used for the loading display before the dashboard page or main page is displayed.

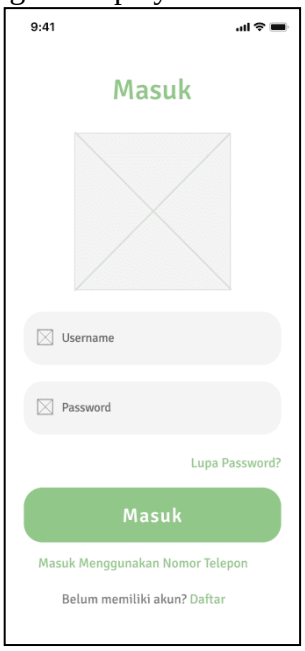

Figure 11. Login Page Design

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The design in Figure 11 above is a login page which consists of 2 input columns, namely Username and Password, there is also a Login button and three links to the registration page, the forgotten password page, and the login page using a telephone number.

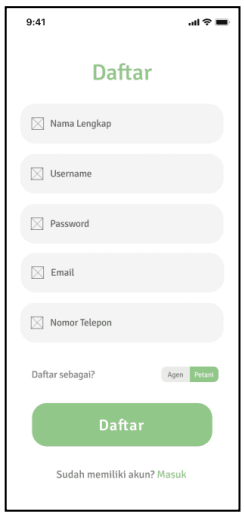

Figure 12. Register Page Design

The design in Figure 12 above is a page for registering, consisting of five input columns, namely Full Name, Username, Password, Email and Telephone Number, and there is an option to register as an Agent or Farmer. There is also a register button and a link to go to the login page if you already have an account.

Figure 13. Home Page Design

The design in Figure 13 above is the home page, the main page for the application which consists of the user name, articles and also market prices. At the bottom there is also a navigation menu.

Figure 14. Latest Market Price Page Design

The design in Figure 14 above is a market price page, which consists of a list of food commodities that farmers in the Pajarakan District area usually grow every year and also contains the latest market prices.

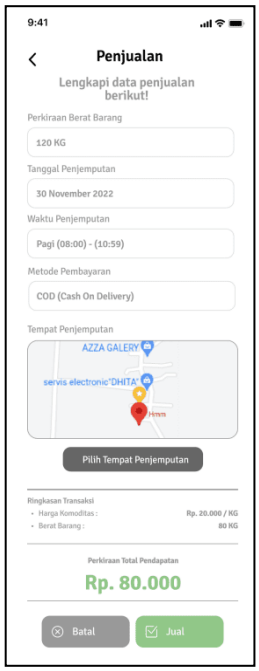

Figure 15. Sales Page Design

The design in Figure 15 above is a sales page that must be completed before the sale is made. Farmers can enter information on the estimated weight of goods, pick-up date, pick-up time, payment method and pick-up place.

4. RESULTS AND DISCUSSION

A. General Description of Research Objects

This research aims to produce an Android-based agricultural product sales application in the Pajarakan District area. This application is designed for admins, as well as two general users, namely farmers and agents, farmers act as sellers of agricultural products, and agents act as places for farmers to sell their agricultural products. Users can see market prices set by the East Java government in real time, and can see tips about agriculture and see news articles that occur in communities around the Pajarakan District area. Farmers and agents can communicate with each other via the chat feature in the application. Users, both farmers and agents, are given two login methods or enter the application via the login page by entering their username and password or via the OTP code authentication page sent via WhatsApp message. This application was built natively using Android Studio and integrated with a web API built using the Codeigniter 4 framework and a MySQL-based database.

B. Program Implementation

Program implementation is a stage that is made to build an application that comes from program code that is built and made into a single unit in an application. The Yuk Tani application was built using 2 different programming language technologies, namely Java which is used in making mobile applications, and PHP as a programming language in backend web applications.

Figure 16. Splash Screen Page

Figure 16 above is the splash screen page which functions as the start page of the application before the home page is displayed.

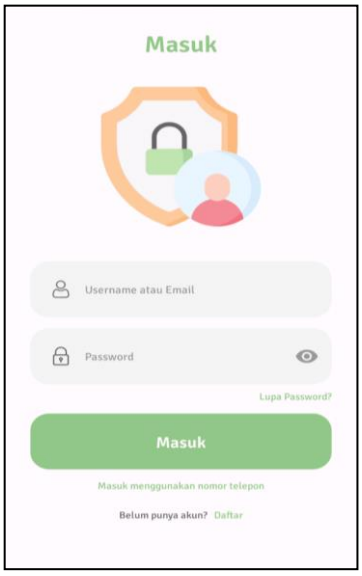

Figure 17. Login Page

Figure 17 above is the login page which functions to authenticate users before entering the application, consisting of a username or email and password.

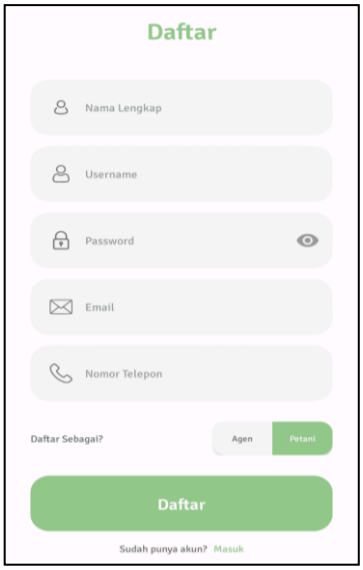

Figure 18. Register page

Figure 18 above is the registration page used for users, both agents and farmers, to register their personal data into the application, especially for users who have not registered, if they have registered they can enter the application via the login page.

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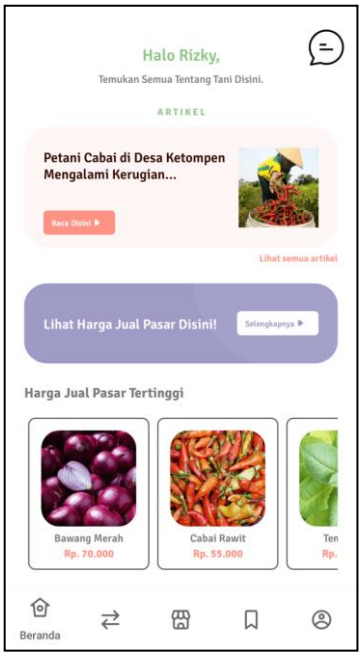

Figure 19. Home Page

Figure 19 above is the home page, namely the main page for users both as farmers and agents. On the home page there is a short name at the top, then there are popular articles, and the highest market prices at the bottom.

Figure 20. Latest Market Price Page

Figure 20 above is a page containing a list of the latest market prices for commodities commonly planted by farmers in the Pajarakan District area.

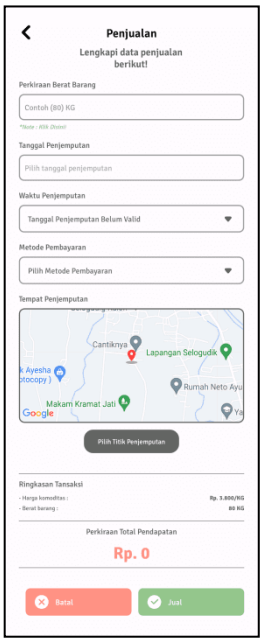

Figure 21. Sales Page

Figure 21 above is the sales page which functions as the last page for farmers when making sales. On this page farmers are required to fill in the estimated weight of the goods to be sold, pick-up date, pick-up time, and are also required to choose a place to pick up the goods.

C. Trials

The trial carried out was using the UAT testing method. This testing is carried out to test a system, before the system is released to users who will use it.

This testing also involves the local community to get respondents from the experiment through application demos. The trial was carried out through a questionnaire form which was created using Google Form as a means of getting respondent results from the trial to users.

1) *Conclusion of Agent Trial Results*

TABLE 1. CONCLUSION OF AGENT TRIAL RESULTS

No	Number of Questions	Number of Respondents	Total Score	Total Criterion Score	Score Index	Interval Value	Interval Description
	27	9	988	1215	81.3%	0% - 19.99%	Very less
						20% - 39.99%	Not enough
						40% - 59.99%	Enough
No	Number of Questions	Number of Respondents	Total Score	Total Criterion Score	Score Index	Interval Value	Interval Description
	27	9	988	1215	81.3%	60% - 79.99%	Good
						80% - 100%	Very good

From the calculation results in the table above, it can be concluded that the test results (agents) got a score of 81.3%, which is in the Very Good interval from a total of nine (9) respondents and twenty seven (27) questions.

5. CONCLUSION

The application was built with the name "Yuk Tani" using Android Studio tools in Java language. Meanwhile, on the backend side, we use the Codeigniter 4 framework for creating the Rest API, and MySQL as database storage. And equipped with a notification feature that is connected to the Firebase Cloud Messaging service.

In this research, we managed to get survey results on the applications created, namely:

1. From a survey of 30 farmers, a test score of (87.3%) was obtained, with the highest score being the aspect of making it easier for farmers to see the latest market prices.

   The survey results show that the "Yuk Tani" application is highly appreciated by farmers, with a test score of 87.3%. The most appreciated aspect is its ability to provide up-to-date market price information. This shows that market price information is an important need for farmers in managing the sale of their agricultural products. This feature has succeeded in providing significant added value for farmers, so that they feel more confident and motivated to use this application in their daily activities.

2. From the survey of 9 agents, a test score of (83.3%) was obtained, with the highest score being the aspect of making it easier for agents to see the transaction pick-up point.

   A trial score of 83.3% from agent respondents shows that this application is also well received by distribution agents. The most appreciated feature is the ability to easily view transaction pickup points. This indicates that logistics and efficiency aspects in the pick-up process are very important for agents. This feature not only helps in better route planning but also reduces the time required to find a pickup location, which in turn increases agent productivity.

So this research succeeded in showing that the "Yuk Tani" application provides significant benefits for farmers and agents. High test scores from both user groups confirm that the developed features meet their needs. The latest market price information for farmers and logistics efficiency for agents are key aspects that have been successfully optimized by this application.

The "Yuk Tani" application has great potential to be further developed by adding other relevant features and improving system performance to reach more users in the future.

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