

UTILIZATION OF E-COMMERCE APPLICATIONS AS AN EFFORT TO INCREASE THE INCOME OF COMMUNITY-BASED FARMER GROUPS

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ABSTRACT

The research aims to find out the problems in the farming community in Pangalengan Bandung West Java Indonesia, to be analyzed as data in developing e-commerce applications as a solution and an effort to increase farmers' income. With qualitative methods, data is obtained through in-depth interviews (semi structured). Through descriptive analysis (5W+1H), the data was processed into an e-commerce design brief using object-oriented approach with System Development Life Cycle Prototyping method. The results showed that low agricultural product prices, market monopolies, and distribution difficulties have led to the decline of agriculture as a job choice. Creating e-commerce-based marketing networks is expected to improve marketing outcomes through competitive prices, shorten the distribution chain, and make agriculture a promising job once again for them. The impact is that farmers are starting to be able to independently market their products, cut the long chain of marketing and also.

Keywords: agricultural, application, digital, e-commerce, monopolies, market.

INTRODUCTION

Marketing digitization has been known to be one of the solutions to the problem of long distribution and marketing chains today, e-commerce has provided an opportunity for a business to be able to expand and develop market reach by providing a platform that supports online buying and selling transactions (Miller, 2020). Apart from providing convenience in transactions, it provides more economic value because it is more effective and efficient (Li & Zhang, 2020) E-commerce is currently a very effective way to market goods and services. However, the uneven understanding of technology makes sellers still fixated on conventional sales methods. This happened in the Tugu Mulya Pangalengan farmer group in West Java. Although they have used smartphones in various daily activities, they have not specifically used e-commerce as a way of marketing. As is known, Indonesia is known as an agrarian country with one of the main sectors of the economy and food sourced from agriculture or crops. A significant contribution to Indonesia's national income, some of Indonesia's exports also come from the agricultural sector, therefore the agricultural sector is considered capable of being a sector that is able to become food and clothing security and is able to absorb a lot of labor (Wibowo, 2012). Over time, Indonesia's identity as an agrarian country began to fade with the decline in public interest, especially the younger generation to develop the agricultural sector as a job, this has an impact on the abandonment of the agricultural sector as a job, the relatively low price of agricultural products and the difficulty of distribution to reach the market are factors that increase the abandonment of the agricultural sector as a job choice. (Rachman & Sumarti, 2019) The decline in interest in working in the agricultural sector is also influenced by a shift in the type and choice of industrial work which is considered more prestigious for the younger generation, urbanization and education levels also affect the decline in interest in working as a farmer. The research aims to find out the problems in the Tugu Mulya Pangalengan farming community in Bandung Regency, to be analyzed as data used in developing e-commerce applications as a solution and an effort to increase the income of farmers, so that this profession has a better future, and remains popular.

Various studies related to e-commerce as a solution to increase farmers' income have been conducted, including a study entitled *The Impact of Rural E-Commerce Development on Farmers' Income* "This study investigates how rural e-commerce adoption influences farmers' income in China. Using data from 2,000 rural households across five provinces, the research highlights a positive correlation between e-commerce adoption and income growth. Smallholder farmers, in particular, benefit significantly, showcasing e-commerce's potential to reduce income inequality in rural areas, in this study the challenge of digital literacy is mentioned as one of the problems that arise. (Zhang, Dong, & Zhang, 2024) study was conducted by (Johnson & Lee, 2019) entitled *"The Impact of E-Commerce Platforms on Smallholder Farmers' Market Access"* This study underlines the importance of e-commerce to improve and expand marketing access by breaking the long chain of distributors or intermediaries. The study mentioned that farmers get the opportunity for wider distribution, more economical, and can negotiate for better prices. Similarly, (Chen & Wang, 2021) conducted a study on the correlation between e-commerce and the income of farmers in China, the researchers underlined that e-commerce can reduce income inequality in rural areas, especially for smallholder farmers. These three studies found similar problems, namely low digital literacy, infrastructure and poor internet connections, especially in rural areas, which are obstacles to the utilization of e-commerce. Research by (Smith & Brown, E-commerce and sustainable agriculture: Opportunities and challenges., 2020) , explores how the influence of e-commerce platforms can encourage sustainable agricultural practices, the authors emphasize the importance of integrating sustainability metrics within e-commerce operations. While Patel and Kumar's research discusses the impact of digital marketplaces on the agricultural supply chain, it is suggested that there is an increase in efficiency, transparency and price reduction. This shows that technology has a good impact on improving the tracking of distribution and marketing of agricultural products, as well as assurance of the quality of agricultural products (Patel & Kumar, 2022). Garcia & Lopez's (2023) research discusses e-commerce as both a tool and a way to promote sustainable agriculture. The article discusses innovative practices that connect environmentally conscious consumers with sustainable farmers and promote organic products through targeted digital marketing campaigns. (Garcia & Lopez, 2023)

In particular, research related to the use of e-commerce in Indonesia is still little done, research is more dominated by community services that conduct training on the use of e-commerce on existing platforms (see (Sumarni & Rahmat, 2021) Meanwhile, the author's research is an end-user e-commerce development that places farmers as users, and the process is iterative, so it is expected to create the best solution for farmers.

LITERATURE REVIEW

Marketing applications or e-commerce is a digital platform that allows users to conduct buying and selling transactions online, facilitated by the internet network, e-commerce provides a space for gathering various activities such as product selection, buying and selling, payment, and delivery of goods, including complaints and returns (Smith & Anderson, Consumer behavior and insights; An analysis of decision-making processes, 2020) Examples of e-commerce applications that are popular in Indonesia include Shopee, Tokopedia, and Lazada, among others. This application can be in the form of a smartphone/tablet application, or web on a computer, usually responsive e-commerce, which is e-commerce that supports display on devices other than computers, such as smartphones and tablets but is separate from the application. There is also a web portal, which is a web that contains various information and services easily from one centralized access point. In its development, web portals also provide buying and selling transactions, presenting product catalog features, buying and selling, financial transactions and shipping (Brown, The Role of Web Portals in Modern Information Systems, 2018)

E-commerce is now a very effective way of marketing goods and services. This applies to farmers who are connected in farmer groups, which are associations of farmers who gather to work together, have common goals such as increasing the yield and quality of agricultural production, and improving welfare, Farmer groups function to conduct training and education, foster cooperation and solidarity, access to agricultural resources, assistance and supervision and also marketing agricultural products. (Hartono, 2019)

In the implementation of these various activities, farmer groups usually work independently, but now community assistance is developing as a way for these groups to have a broader horizon in solving various agricultural problems. Community-based farmer groups have great potential to improve the productivity and welfare of their members through cooperation and solidarity (Jones, 2019) Community-based agriculture

involves various elements of society such as families, communities, NGOs, or non-profit organizations that are involved and influential in various aspects related to the interests of the community in the area where the farmer group joins. This can lead to more sustainable agriculture due to community participation, economic empowerment, knowledge and resource sharing, and strengthened social relations (Jones, 2019) (All of this can create strength for agriculture itself in solving agricultural problems.

Some of the problems that arise in relation to agriculture are agricultural problems, including low prices for agricultural products, market monopolies and the difficulty of distribution to reach the market, making it difficult for agriculture to develop. Regarding this problem, several project-based studies have been conducted as a solution to the problem, one of which is the utilization of digital marketing applications in the Sapto Gati Farmer Group in Pojok Garum Village, Blitar Regency, to increase sales of their agricultural products. Which previously used conventional marketing methods (Hartami, 2022) as well as research by Alridhani & Persada (2020), which provided training and marketing assistance through social media and e-commerce in Sumberejo village. In this study, the research team provided training on how to create social media accounts and also studied marketing in e-commerce (Alridhani & Persada, 2020).

The utilization of marketing applications in any platform by farmer groups has the opportunity to increase sales of agricultural products by opening up easy access to new markets, namely audiences who are familiar with technology and can also increase the efficiency of the marketing process" (Brown, Utilization of Marketing Applications in Agriculture, 2018) According to White, farmer groups that utilize marketing applications experience an average income increase of 20% in one year (White, 2021). Supporting this is the fact that Indonesia is known as the 5th highest ranked country in the world with more than 185 million internet users. This means that the culture or habit of using internet technology and everything in it is very high, creating opportunities for e-commerce to remain in demand.

METHODOLOGY

This research used qualitative methods, which is a type of research that explores and understands the meaning obtained from a number of individuals or groups of people, seeks to understand the meaning of human experiences through methods such as interviews, observations, and case studies (Smith J. A., 2020). Data is obtained through in-depth interviews (semi-structured) with the aim of obtaining in-depth and accurate information from sources through direct interaction with the chairman and members of the Tugu Mulya farming community in Pangalengan, 32 members were interviewed. The results of the interview are then analyzed descriptively the data is processed into a design brief, in design with an object-oriented approach method with System Development Life Cycle Prototyping. The stages are as follows: 1) Selecting a case 2) Collecting data through interviews, field observations, and literature studies; 3) Analyzing data using 5W + H analysis. and then the findings of the research results are reported and become input in making e commerce applications for this farmer group.

DISCUSSION

From From the results of interviews and field observations conducted at the farm location, there are several things that become the main discussion that emerges, namely the difficulty in the process of marketing their crops, even though this farmer group is a group that is well structured and organized in terms of governance and the latest agricultural technology, but when faced with the process of distributing the harvest The following is a summary of the results of interviews and observations. From all members, several problems emerged, including

- The price of seeds and fertilizers is expensive, government policies are perceived as uneven
- 2. The price of farm produce during harvest is weak (fluctuations in the stock of abundant crops)
- Lack of collectors, resulting in uncompetitive prices
- Credit problems and middlemen, related to farmers' economic problems
- The presence of imported products from China with competitive prices
- The marketing area is too far from the city, causing expensive transportation costs
- The collectors give me a price that is far away from the market

- Now the weather is also starting to be irregular, sometimes it rains and we don't use seasons, so it's difficult to predict planting time, not to mention marketing problems.
- The market system is lacking in bridging farmers and consumers
- Monopoly of distribution and marketing in the wholesale market
- Crops are marketed far away from the location, even though nearby areas need vegetables and farm products

It was found that the answers from the interview results matched the reality in the field, the lack of collectors were true because from the results of information and observations made there were indeed a limited number of collectors in the Tugu Mulya Village area, this certainly had an impact on prices that It was found that the answers from the interview results were in accordance with the reality in the field, the lack of collectors was indeed true because from the results of information and observations made, the number of collectors in the Tugu Mulya Village area was limited, this certainly had an impact on prices that were less competitive, the absence of competition could make prices monopolized unilaterally by collectors. Another thing that was also found was the difficulty of direct distribution to the market, most traders in the wholesale market have partnered with collectors, making it difficult to sell directly to the market. Access roads that are not all well connected and built are also one of the factors inhibiting the marketing distribution of farmer group products in Tugu Mulya Village. The emergence of some commodities from China is another problem, with cheaper prices and better quality. Even vegetables and fruits around Pangalengan come from Malang (East Java) and Yogyakarta. The economic condition makes some farmers take irresponsible loans, so they depend on middlemen who make the harvest price uncontrollable. Basically, the above problems are common in Indonesia, this is in line with what was stated by, (Sumarni & Rahmat, 2021)) in his research entitled Challenges in Indonesian agriculture: A review of the problems faced by small farmers

Untuk menyelesaikan masalah tersebut dilakukan analisis 5W+ H (see table 1), which is a problem-solving and decision-making tool that helps to break down and understand the core components of a situation analysis) (Mohan, 2019)

Table 1. 5W+H Analysis

5W+1H	Question	Answer
What	What is the problem behind the design of this marketing system?	Difficulty of crop distribution, lack of price competition due to few collectors, lack of technology utilization in the agricultural sector.
When	When did the problem of marketing the farmer group's crops occur?	The problems of difficult distribution and uncompetitive marketing prices begin to occur when the difficulty of distribution to the market, the lack of access to other collectors so that prices are not competitive, and the decline in young people's demand for farming make the agricultural sector increasingly lagging behind in terms of technology utilization, and this phenomenon occurs until 2023.
Where	Where is this problem occurring?	This problem occurs throughout Indonesia, not just in a Tugu Mulya where the agricultural sector is presentation is mostly occupied by people with middle to lower education, the coverage area of this marketing system design is Bandung Regency, West Bandung Regency, Cimahi, and Bandung City.
Who	Who will benefit or be targeted by this Marketing system design?	Those who will benefit from the design of this system are of course farmers as the object of the phenomenon behind this design and will later act as sellers or producers. Then who will be the target and benefit from this design is the general public who will later act as users and buyers or target markets in this Marketing system.

Why	Why choose the Marketing system as the object of design as a solution to the problem of marketing farmer group crops?	The reason for taking the Marketing system as the object of design is as an effort to provide solutions to problems from the difficulty of distribution of marketing results, price monopoly by collectors, and increase the utilization of digital technology in agriculture.
How	How is the solution to the problems that occur in the marketing process of farmer group crops?	The main problems raised in this design process are the difficulty of distribution, price monopoly by collectors, and the lack of use of digital technology in the agricultural sector. The solution to these problems is to design a system that is able to become a forum for marketing and distribution of farmers' crops, with the use of the marketing system as well as being a step in utilizing digital technology in the marketing sector.

Source: author's work.

From the analysis of the data that has been collected, outline the problems that occur from the marketing process of farmer group crops. The following summary can be taken based on the results of the analysis:

- The distribution process is less effective, which affects the cost and price of crops.
- Infrastructure and road access are not all connected to market channels, making it difficult for collectors to pick up directly and shorten the distribution flow.
- Not many have tried to do digital marketing, the role of the parties is needed to provide education and assistance so that farmers can understand modern market mechanisms and can compete with other industries.
- Lack of education or knowledge for modern agricultural technology.
- The lack of counseling makes farmers only able to work in conventional or traditional ways.
- The role of the government in maintaining the stability of market prices, so that the welfare of farmers can be guaranteed and will have an impact on increasing the interest of the younger generation to try to pursue the agricultural industry which is increasingly less attractive these days.

From these problems it can be concluded that the selection of the Marketing system as the object of design is a solution to the problems that exist in the marketing process of farmer group crops. The design of this system in addition to being a distribution and marketing medium is also an effort to utilize digital technology in the marketing process to make it easier and reach a wider market, another benefit of designing this system is that it becomes an option from the lack of collectors and price monopolies, with efficient distribution flow. Marketing and utilization of digital technology are expected to be able to increase competitive crop prices so as to make farmers more prosperous and the agricultural sector is again a field of work that is back in demand.

Design Solution

The Marketing system as the design object is an answer that is relevant to the existing problems and in line with the times or technology at this time. The selection of the object of this system design is also one of the steps to utilize digital technology, by following digital developments, of course, it will provide better opportunities and opportunities for farmers so that they are not increasingly left behind, both in terms of agricultural insights and the use of technology in the marketing process.

In this stage the researcher formulates the application user stake holder (target audience). According to Gregory (2004), the communication effect starts from the message that will be conveyed to the audience. Then the message is received and later there will be a change in knowledge, understanding, perception, and finally will affect the attitudes and actions of the target audience. In designing the Marketing system for the harvest of the Tugu Mulya Village farmer group, it can be divided into two target audiences, namely, Selling Partners (Tugu Mulya Farmer Group) and Buyer Partners. The following are the target audiences of each partnership :

- Selling Partner & Buyer Demographics
 - Gender: Male and Female
 - Age : 27-35 years old
 - Education : Junior High School - College
 - Economy : Middle, Upper Middle, and Upper

- Occupation : Farmers, wholesalers, middlemen

b. Geographical

Segmentation is the division of target audiences based on geographic reach (Morissan., 2020) Geographically, the target audience includes highland areas or agricultural areas such as the South of Bandung Regency area, where one of the main income is from farming, and in these areas there are many groups of farmers who have begun to utilize digital technology in their agricultural activities, especially in the marketing sector.

c. Psychographics

Psychographics according to Prastejo quoted by Hartanto psychographics can refer to three parts of AOI (activities, interests, opinions) (Hartanto, 2005). The Activities of sales partners are members of the Tugu Mulya Farmer Group, in addition to farming activities with knowledge from generations or parents, they also began to seek and get information from farmer group counseling groups on social media and information from other digital media such as YouTube and Google. The interest of the sales, particular is watching modern agricultural methods and information on the development of the agricultural sector from seeds to the latest selling prices through digital or online media. But the buyer is some one who love to shoping fresh vegies & fruit. Opinion, which is how the audience argues and responds to something. In this case, farmers as the target audience have a very open view, that are open to changes and the development of new things that lead to progress.

d. Consumer Insight

Consumer insight refers to a deep understanding of consumer behavior, motivations, and preferences, derived from analyzing data, experiences, and observations (Smith & Anderson, Consumer behavior and insights; An analysis of decision-making processes, 2020) From the results of data analysis, consumer insight from the target audience that has been determined is obtained as follows:

- Have a habit of looking for and or finding information from digital or online media.
- Likes something practical and easy.
- Communicate with social media.
- Have a high online shopping culture.
- Dependence on the internet network in daily activities.
- Care about healthy living.
- Consumptive

Design Strategy

The design strategy that will be used is to create a marketing system or marketing the harvest of the Tugu Mulya farmer group through online media, namely the application. The purpose of communication is to bring about a common understanding or change perceptions, and even behavior

Navigation System

The navigation structure on an application includes an outline of the application navigation system and the display design or interface of the website or application, navigation will make it easier for users to explore features in the application or web (Suryanto, 2017) The navigation system also serves to connect between

content or pages in the application (see figure 1).

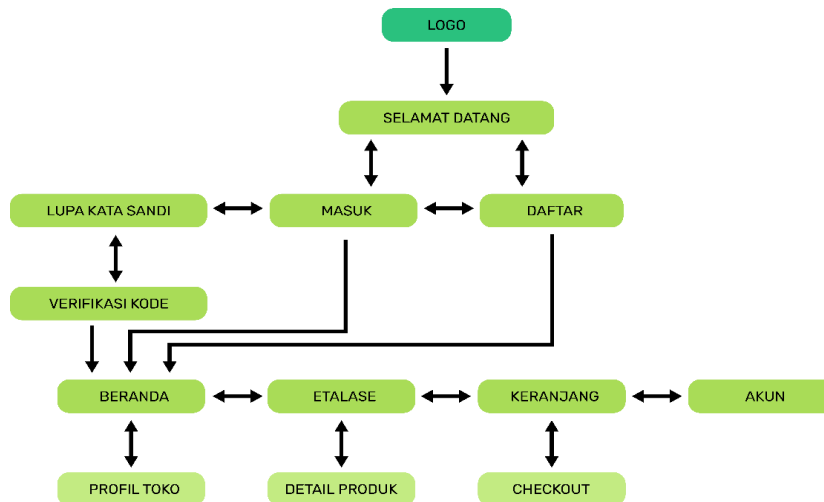


Figure 1. Apps vavigation system in bahasa Indonesia

Source: Author's work (2022).

Main Media

The main media that will be used in this design is an online marketing system through application media. An application is a ready-made program whose use is to carry out a command from the application user which aims to get an accurate result in accordance with the purpose of the application creation process. The design layout uses a linear layout, so that the user interface supports the convenience of both farmers and buyers based on user experience. While the colors used are fresh colors, representing the freshness of vegetables with Hex #8DB600 RGB color code. The typography used is a clear, sans serif, firm typeface to provide visual comfort in reading. (see figure 2)

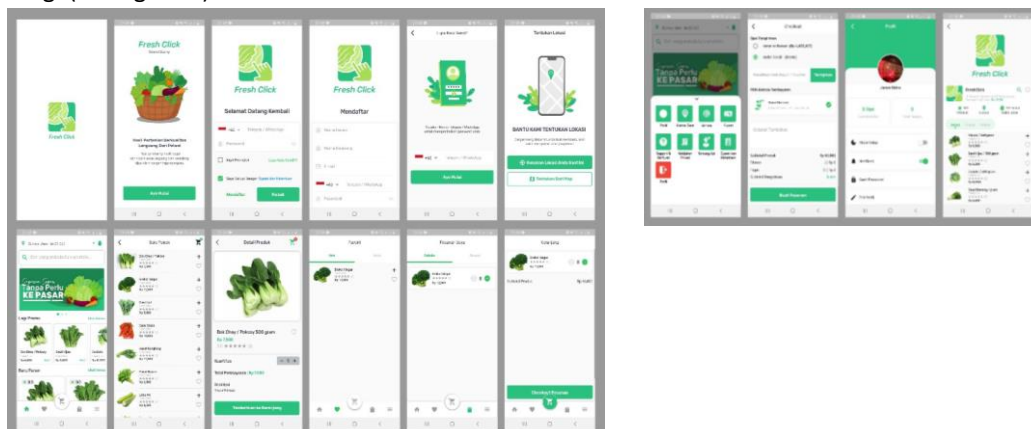


Figure 2. The visual design of the application

Source: Author's work (2022).

The finished design or display will be simulated in terms of appearance and interactivity using Adobe XD, the flow and outline when it becomes an application. This stage also serves to facilitate developers when working on the coding process. At this stage, the process of converting the prototype or UI design that has been done in the previous stage into an application is carried out. This stage is carried out by developers using Flutter software

with the programming language used is the Dart Framework Flutter. This stage is a process where the finished design or display will be simulated in terms of appearance and interactivity using Adobe XD, the flow and outline when it becomes an application. Audience and testing with users (farmer & Buyer) were conducted five times as an effort to improve the system, UI and UX. And then the next process is the registration of Apps to the Google Apps Store, followed by marketing to consumers closest to the East Bandung area such as communities, restaurants, retailers and traveling sellers. The results show the opening of new market opportunities, more effective and efficient buying and selling relationships. Although new challenges arose related to stocking and its location.

CONCLUSION AND RECOMMENDATION

The use of android application media can be a solution to the problems of farmers in the Tugu Mulya Farmer community. The application as a design solution can also expand or find new market segmentation so that it can be an alternative sales option to be able to get competitive prices because farmers can determine their prices and marketing mechanisms independently. However, its actualization requires a careful look at the problem, as in other parts of the world there are quite complex digital literacy problems, so researchers need to see this as a new challenge that must also be resolved. With iterative and sustainable design, e-commerce can be the right marketing space for farmers, so that each problem can be reduced as much as possible so that a new marketing space can be created that can improve the quality of life of farmers.

ACKNOWLEDGEMENT

Thank you to the Tugu Mulya Farmer Group, for their willingness to take the time to conduct interviews with the author. The author also thanks the entire IC OBEST 2025 committee for accepting this article.

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