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E-Commerce as a Tool to Increase Farmer Welfare

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Abstract

The Internet of things is the new paradigm in the way of live human result of telecommunication and information technology improvement. That paradigm also influences the agriculture sector. Currently, many agriculture apps are introduced in play store apps by some startup companies. At least ten apps are recognized in the android platform, such as Tani Hub, Tani Link, Dokter Tani, etc. Each contains valuable information regarding cultivation tips, product price, and experience sharing.

Many apps provide up-to-date agricultural product prices such as vegetables and fruit. It connects a farmer and buyer; thus, the customer can buy the product directly. It is called e-commerce. That idea aims to erase the long terms distribution because of Tengkulak role. Tengkulak is a person who buys the farmer's product directly and on a vast scale. The problem is that tengkulak usually believes that its effect is lower than the market price. Therefore, even though the farmer obtains a small benefit or even loss, they still encash it because they have no market option through agriculture apps. The startup developer attempts to solve this problem. Based on this fact, this research aims to examine the role of agriculture apps (e-commerce in agriculture products) in solving the farmer's concerns and increasing their welfare.

This research uses the deductive – qualitative – rationalistic method. The reasoned approach means the research start from basic theory regarding the application and compares them to the agriculture apps information inside. The qualitative approach means this research is conducted based on qualitative data and analysis. Rationalistic means the data of this research is logical and has a rational sense. This research uses descriptive qualitative, normative comparative, and contrasts analysis tools to reach the goals.

On the other hand, the bond between tengkulak and farmer is not an ordinary bond between seller and buyer. In some places, such as in Demak Regency, the tengkulak is involved in the social structure because they are recognized as an elder in the community, such as tetua desa, head of the village, and religious leader. The other problem is not all farmers have the capacity and knowledge to operate the apps. These phenomena fail e-commerce goals in price control. However, in the other condition where the farmer has their own community company, such as operating Tani, the app successfully improved the farmer revenue because of direct sales at a reasonable price. The koperasi has a significant role in managing the farmer's products and promoting them through apps or digital marketing.

Keywords: *E-Coomerce, Agriculture, IT, Social, Welfare.*

1. Introduction

Indonesia, especially Java Island, is recognized as an agriculture-based economy. This island has fertile soil, which comes from volcano ash sedimentation. Moreover, the tropical climate makes Java Island appropriate for cultivating many plants. The water availability also makes this land produce corps in higher quality and quantity. With those natural resources, it is undeniable that Java Island holds the main food barn in Indonesia. Unfortunately, the great resources and high level of agriculture suitability do not become coherent with the farmer's quality of life. Indonesian farmer faces several fundamental problems, such as:

1. Farmland availability;
2. Expensive fertilizer and its uncertainty in availability;
3. Expensive farm labor;
4. The low price of the agricultural product;
5. The middleman in the agriculture sector.

Those problems cause many farmers to live in poverty and have no decent revenue. In Indonesia, the farmer's average income is only 1.5 million up to 2 million rupiahs (corps and horticulture farmer). This situation makes the younger generation has no dream of being a farmer. Although they only graduate from middle school, they prefer to be industrial laborers in the city.

The low level of agriculture bargaining position poses a threat to agriculture sustainability. Even though agriculture is a vital sector in full fill human basic needs. Moreover, most rural areas are agricultural land, and many rural people have a high dependency on their farmland. Regarding improving the agriculture sector performance, the central government launched many agriculture programs such as Agroecological Zone and local economic development until Agroindustry. These

programs enhance the agriculture sector but do not adequate for improving farmer welfare. The main problem in farmer welfare is the price of agriculture products. Often, the agricultural development should be sold at a low price, below the production cost. Therefore, the farmer lost in several harvest sessions.

The low price of agricultural products is caused by several phenomena, particularly the middleman (Tengkulak) role in agriculture [1]. They buy the product with ijon system (sold when the fruit is not ripe) or tebas system (all fruits on the tree in single price, doesn't count per kg). The sale system is where the middleman buys the plant's yield. It means they buy it before harvest season. Texas system is the sale system in which the middleman buys the product aggregately. They do not buy per kilo price but the per plant (fruit) and per hectare (corps and vegetables). The reason for the farmer sale is:

1. They need the money recently;
2. They do not know the other place to sell it rapidly;
3. They have a dependency relationship with the middleman

At that time, internet technology had improved significantly. The internet of things is introduced to make human life more manageable. Fortunately, the internet of things also comes into the agriculture sector in the e-commerce form. Startup developer presents much android application to solve farmers' problems. At list 10 apps are recognized in the android platform such as Petani, Pak Tani Digital, Tani Hub, Tani Link, Dokter Tani, Agripedia, Tanijoy, Limakilo, Pantau Harga, Simbah and etc. Each contains helpful information regarding cultivation tips, product price, and experience sharing. The research question is how effective e-commerce is in solving the farmer problem or improving welfare.

2. Methodology

2.1 Method

The research regarding "E-Commerce as a Tool to Increase Farmer Welfare" use the deductive – qualitative – rationalistic approach. First, the deductive is conducted by looking for the theory regarding E-Commerce. Secondly, decide the study area. In this case, it is Demak Regency. Thirdly collect the data. The last is comparing the theory and the data.

The qualitative method is chosen because this research is based on qualitative facts such as the role of E-Commerce in solving the farmer's problems. The qualitative process involves the analysis tool of the study. So that it uses descriptive qualitative, comparative and qualitative normative as the analysis tools. This research uses primary and secondary techniques in the collecting data phase. The primary is conducted by interview and technology observation. A literature study leads the secondary.

2.1 Literature

E-commerce is the method of informing, selling, buying, and marketing things and services through electronic media such as the internet, television, or other computer networks [2]. E-Commerce automatically consists of data transfer and exchange, management system, and data collection. E-commerce has become popular in Indonesia because of its promising future and benefit.

Kind of E-Commerce [3]:

1. Business to business e-commerce

   Business people use business (B2B) e-commerce to run their businesses. In case they recognize and are involved in the business proses. It belongs to long-term cooperation because they trust each other and create mutualism symbiosis in the business. B2B involves two companies in the sale process.

2. Business to customer e-commerce

   Business people and customers conduct business-to-customer (B2C) e-commerce. For example, the producer sells the product to the customer through online media. In case the producer runs the business towards offering their product to the customer without reseller feedback from customers. It means the customer uses it for themselves.

3. Customer to customer e-commerce

   The customer conducts consumer-to-consumer (C2C) e-commerce. It means it to the customers of a particular product resale to another customer.

4. Consumer business e-commerce

Costumers conduct consumer-to-business (C2B) e-commerce with the businessman. In this case, the customer gives information to the producer regarding the detail and specification of the things needed by the customer. The next step is the producer offering the items appropriate to the specification.

1. The benefits of e-commerce
2. Make communication between producer and consumer easier;
3. Make marketing and monitoring easier;
4. Make the threshold of consumers wider.;
5. Make the selling and buying process easier;
6. Make the payment process more accessible because of the online method;
7. Make information spread easier.

The Advantages of E-Commerce

There are many advantages to e-commerce. One of them is selling products or services online without setting up a large shop or office as offline business people do as a place of business. In addition, by utilizing the internet network, you can market your products or services to consumers anytime and anywhere. The benefit advantages of e-commerce are:

1. No need for a shop building;
2. The price is lower because it directly sells from the producer to the consumer.

3. Result

3.1 Tables and Figures

In the 4.0 industry era and the internet of things, startup developers attempt to create thousands of applications to make human life more manageable. The application also comes to the agriculture sector. To help the farmer improve their income. This application runs on the android platform. It can be operated on an android mobile phone or android emulator such as NOXX and BlueStack on the PC.

Fig. 1 Kind of Agriculture Application

Every application has a specific function and menu. However, most of them provide information regarding the agricultural product price. The farm product consists of corps, fruit, vegetables, and animal product. In addition, some of them provide information regarding cultivation counseling. The kind of android application information is in the table below.

Table 1 : The Kind of Information Agriculture Application on Andorid Platform

Application Name	*Information*		
	General	*Counseling*	*Q n A*
Petani	√	√	√
Pak Tani Digital		√	
Tani Hub			
Tani Link	√		√
Dokter Tani		√	√
Agripedia			
Tanijoy			
Limakilo			
Pantau Harga			
Simbah	√	√	

Based on the table above, three application provides general information regarding the application and the product. The application includes available information is Petani, Tani Link, and Simbah. All of them give the information regarding what kind of application they are and what type of product in their application. Four application provides counseling

regarding cultivation. They are Petani, Pak Tani Digital, Dokter Tani and Simbah. The counseling consists of choosing the best seeds, cultivating the corps plants, fruits plants, and vegetable plants properly, how to harvest properly, and how to pick up the fresh product. In this case, dokter tani provides detailed information regarding plant diseases and how to solve them.
Three application allows asking for something related to agriculture and product directly. The application that provides the Q n A (question and answer) menu is Petani, Tani Link, and Doter Tani. This feature lets users communicate with the application administrator through the application. The other users can learn the problem and solution because the Q n A feature is the public version. Besides the information, the agriculture application also provides the sale feature. The sale feature of the agriculture android application is in the table below.

Table 2 : The Kind of Sale Feature in Agriculture Application on Andorid Platform

Application Name	*Sale*				
	Catalog of Commodities	*Proce*	*Transaction*	*Mapping*	*Bargaining*
Petani	√	√	√		
Pak Tani Digital	√	√	√	√	√
Tani Hub	√	√	√		
Tani Link	√	√	√		
Dokter Tani	√	√			
Agripedia	√	√	√		
Tanijoy	√	√	√		
Limakilo	√	√	√		
Pantau Harga	√	√	√		√
Simbah	√	√	√		

Based on the table above, all applications provide real-time information regarding commodities and their price. It means the price is actual and based on a specific location where it is available. The consumer can consider and decide what kind of commodities, budget, and place to buy them through this information. However, dokter tani is unavailable to do the transaction. It only gives the news. The apps containing a catalog of products attract more downloaders than others [4]. Hence, all agriculture apps provide a colorful record to attract the app downloader and improve the broader market. In a pandemic era, the lockdown policy triggered many new customers to download and do the transaction through agriculture apps [5].
Pak Tani digital has detailed information regarding location orientation. It provides a map to look for the specific place of the farmer or seller. Therefore, the buyer can go to the location directly. Furthermore, it opens the opportunity for the buyer to pick up the commodities by themselves. Meanwhile, the other application completes the transaction by delivering the product to the consumer.
Pak Tani Digital and Pantau Harga provide the other unique feature. Both of them allows for bargaining feature. This feature enables the consumer to bargain the product. Suppose the salles accept the bargaining price so the transaction can be done. It is an exciting feature because it makes the price flexible, and they get the best price. Thus, the consumer does not buy the product over price, and the farmer receives decent benefits.
The android application in the agriculture sector provides much information such as the product and price until the counseling regarding the cultivation problem. However, not all of them belong to an E-Commerce application. E-Commerce requires specifics feature that can be used to sell agricultural products. Based on the benefit of E-Commerce, there is the feature classification of the agriculture application.

Table 3 : The Benefit of E-Commerce at Agriculture Android Apps

Nama Aplikasi	*E-Commerce Dimension*					
	Communication	*Marketing*	*Costumer*	*Transaction*	*Payment*	*Information*
Petani	V Direct	√	√	√	√	√
Pak Tani Digital	√	√	√	√	√	√
Tani Hub	√	√	√	√	√	√
Tani Link	V Direct	√	√	√	√	√

Nama Aplikasi	*E-Commerce Dimension*					
	Communication	***Marketing***	***Costumer***	***Transaction***	***Payment***	***Information***
Dokter Tani	V Direct	√	√			√
Agripedia	√	√	√	√	√	√
Tanijoy	√	√	√	√	√	√
Limakilo	√	√	√	√	√	√
Pantau Harga	√	√	√	√	√	√
Simbah	√	√	√	√	√	√

Based on the table above, 9 of 10 Agriculture Android applications can be identified as e-commerce. This is because they fulfill the requirement regarding the benefit of E-Commerce. The Dokter Tani is the only android application classified as E-Commerce because it has n transaction and payment feature. Meanwhile, on the side of potency to solve the farmer problems, only five applications have a good performance. The application role in solving the farmer problem is in the table below.

Table 4 : The Role of Agriculture Android Apps

Application Name	*Solve Farmer Problem*		
	Price	***Market***	***Counselling***
Petani	√	√	√
Pak Tani Digital	√	√	√
Tani Hub	√	√	
Tani Link	√	√	√
Dokter Tani	√	√	√
Agripedia	√	√	
Tanijoy	√	√	
Limakilo	√	√	
Pantau Harga	√	√	
Simbah	√	√	√

Table 4 lists five applications that can completely solve the problem regarding price, market, and counseling. The applications are Petani, Pak Tani Digital, Tani Link, Dokter Tani and Simbah. On the other side, all application contains the actual price product. In terms of improving sales and broader the market, especially in the pandemic era, pak Tani and tani hub have a significant role. It reaches more than 25 % of average sales. However, many of them do not count as successful as both apps.

Agriculture e-commerce made the consumers and farmers meet virtually and directly. They can do a transaction with the optimal price for both [6]. It can help the farmer sell their product directly without a middleman role. Middleman is the leading actor in price product increased. The middleman chains can be cut by E-Commerce. However, in several cases, such as in Demak Regency, E-Commerce does not become effective in solving this problem. The middleman in Demak Regency has a characteristic such as:

1. The middleman is usually an informal leader in the social structure, such as the elder of the community and the elder in the religion;
2. The intermediaries are sometimes who have a formal position in the village, such as the head of the town and public servant;
3. The patron-client relationship. In this relation, the farmer is in debt to the middleman. Therefore, the farmer should sell their product to them;
4. The middleman doing monopsony for a particular product. In some cases, such as horticulture products, the middleman is the only person who buys the farmer's product in that area;
5. In some cases, the middleman is the person who is authorized by the agro-industry to supply their raw material. In this case, the farmer has no choice except to sell to them. Because in the rural area, market knowledge is low.
6. The farmer cannot operate the agriculture application. In that condition, the farmer can not attract consumers directly. Therefore middleman is a rapid solution to earn money rapidly.

These problems make the goal of E-Commerce to cut the middleman chain is failed. In some conditions, these problems can be solved by the farmer informal community corporation called Koperai Tani. It manages the financial resource of farmer (community), agriculture knowledge, human resource and product sales. The existence of Koperasi Tani has a significant role such as:

1. Help the member in full fill the capital;
2. Help the member to sell the product;
3. Keep the piece in the normal position;
4. Become a place to strengthen farmers' bond against the bad middleman.

Through the Koperasi Tani and E-Commerce, the chains of resellers and intermediaries can be erased. Thus, the farmer earns a decent income from their product.

4. Conclusions

Digital technology improvement makes everything in human life more manageable. The internet of things promotes internet applications as tools to do something. E-Commerce is the one kind of internet thing in the sales sector. It erases the reseller chain, and not necessary to have a conventional shop building to sell something. This market-place concept creates a virtual market with the actual transaction.

In the agriculture sector, many e-commerce applications are introduced to help farmer sell their product. This application provides valuable information regarding cultivation, counseling, and Q n A directly to the expert. Moreover, it offers the sale feature. The farmer can sell the product directly to the consumer through this feature, monitoring the price fluctuation and bargaining with the buyer. On the consumer side, agriculture e-commerce makes them get the product at a reasonable price and lower than the seller's price. Moreover, the product is fresh from the farmland. In the general condition, E-Commerce can cut the middleman or reseller chains. However, in the situation where the middleman and reseller involve in social structure, it does not become effective. To help E-Commerce in this situation, the farmer needs to strengthen their bond and establish the farmer informal community corporation (koperasi tani).

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