

# Digital Economy Through E-Commerce in Agriculture in Indonesia

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**Abstract**—Agriculture potential resources which very abundant in Indonesia must be responded with marketing digitalization of its product. Digital economy which developed rapidly in this several years must be utilized with the production of agricultural products in Indonesia by farmers to maximize it's potential. This research is conducted by literature study. Digital economy will support agriculture activity to give welfare to human life. To manage agriculture well, farmers must adapt in the middle of change of economic pattern because of Covid-19 pandemic. Digital economy through e-commerce can solve the problem. Agricultural products can be marketed toward consumers to give direct welfare to farmers.

**Keywords**— *digital economy, e-commerce, agriculture*

## I. INTRODUCTION

The interactions that occur between humans continue to change along with the development of dynamics in the modern era. Direct interaction which is basically also to develop social networks turns into indirect interactions with technological social media intermediaries [1]. This interaction is quite good in developing relationships and networks at this time, especially when the world community is hit by Covid-19. The use of technological tools in communicating and interacting changes old habits in every line of life. These changes require humans to continue to adapt to their circumstances which are in line with the evolution of increasingly developing technology [2,3]. The shift in the way to survive changes old habits into new habits that tend to be practical. Every fulfillment of needs, including the way to fulfill needs, also shifts according to an increasingly modern practical lifestyle. Thus, old ways or patterns shift to new patterns that are more practical in meeting their needs [4]. This new method is included in the world of commerce and trade, including trade in agricultural products or the agricultural industry.

Old habits with traditional trading or trading techniques are transformed into new habits that tend to

be more practical, namely trading through internet media or better known as e-commers [5]. Digital platforms have sprung up that offer convenience in transacting and interacting in the economic field [2]. Business actors are competing in offering their products through digital media with various platform models. All items are tried to be offered by offering an easier and more practical transaction model. So that consumers are carried away with the atmosphere with this practical model and participate as economic actors in the digital world.

The habit of digital transaction models carried out by the community, especially the technology-savvy community, shows an increasing percentage. The shift in the shopping behavior of people who are technology literate from ordinary shopping to online shopping is quite increasing. According to data from The Nielsen Global Survey of E-commerce, out of 30 thousand respondents who have internet access from 60 countries in Asia Pacific, Europe, Latin and North America, and the Middle East. online channels in buying a variety of products or services to meet their daily needs. Nielsen noted, in Indonesia itself, the same data shows that the growth in the use of digital devices in Indonesia's big cities has reached 88 percent. Of course this device is one of the most important and significant factors in encouraging online shopping behavior. Furthermore, the same data shows that Indonesia has the top ranking globally in terms of smartphone use for online shopping. The data shows that as many as 61 percent of consumers choose to shop using smartphones, and another 38 percent choose tablets or other mobile devices. Meanwhile, 58 percent of consumers prefer to use a computer [6]. This shows that the shift in the way of shopping and interacting in cyberspace continues to develop, which later becomes a new market in marketing products, both services and goods.

Offering goods through online media not only offers products in the form of goods that have a minimal level of damage (household appliances), but also offers goods with various specifics that can be offered,

including offering agricultural products such as vegetables and fruits. Consumers are given the convenience of shopping in cyberspace whose level of practicality and convenience is quite satisfactory. Buyers are not preoccupied with going to the market, shopping which may be physically exhausting, but consumers can sleep at home or anywhere shopping online, in order the goods have arrived and do not bother the buyer. Of course, these methods are shopping models that have rationality for buyers. The choice of a digital platform as a shopping medium is the most rational choice according to consumers.

Government policy to prevent transmission of Covid 19 like Pembatasan Sosial Berskala Besar (PSBB) or semi lockdown and work and learn from home has disrupted goods and personal mobility. To keep physical contact and dodge public place, consumer prefer to buy online with utilizing every marketplace providing varies of basic needs including agricultural commodities. Shopping online can be a solution to get daily needs so consumers change to buy massively to online platform. Utilization of e-commerce and social media as important channel of marketing in the middle of pandemic condition is one way to promote product or agrobusiness enterprises [7].

Beside the change to online shopping, in the pandemic consumers prefer goods which is very needed not by the wants. The continuity of pandemic which can not be predicted cause this change. Work from home policy also encourage housewives to to cook foods. This condition demand many restaurants to change their sales pattern by dine in toward online. Covid 19 pandemic has increased agricultural commodities online almost 400% [8].

This condition is opportunity to e-commerce perpetrator to develop and implement right strategy to survive and profitable. Survei result of Iprice (2020) show that online shop application that mostly used is shopee (82%), Tokopedia (56%), Bukalapak (41%), Blibli (15%) etc (15%). Survey result in May 2020 showed that about 45% respondent used about Rp 500 thousand till Rp 2 millions to buy basic needs. Research result of Djaenudin et al. told that e-commerce sales system can decrease transaction cost. But in other side, e-commerce in Indonesia face several problems such as: illiteracy of digital technology knowledge in farmers, online payment, regulation and internet network which is not stable in every regions.

The digital-based government policy still lies in the upstream sector of agriculture, namely the Regulation of the Minister of Agriculture of the Republic of Indonesia Number 41/Permentan/OT.140/3/2014 concerning Guidelines for e-Planning-Based Agricultural Development Planning which has a scope that includes the management of e-Planning, preparation and proposal assessment, operation of the e-Proposal application, and management of the

Agricultural Area Planning Information System (SIKP).

The digital agricultural economy in addition to increasing income can also encourage agricultural development and support farmers to compete globally. As stated by Bahua (2016) that the existence of agricultural development that is more in favor of farmers has an impact on farmers' confidence in trying to increase the productivity of their farming business [9]. With the agribusiness and agro-industry systems that are oriented towards non-formal education, it shows that there are challenges aimed at farmers in facing competition in the global market. Likewise with the development of agricultural technology that can be a solution in agricultural development. The digital agricultural economy is a continuation of the agricultural economy which is utilized by using mobile phones to smartphones whose use is in the form of short messages, calls (phones), to social media applications such as Whatsapp, Facebook, Instagram, and even other special applications.

On the other hand, the facts show that the agricultural sector has become a driving force for the nation's economy in various countries. Subejo (2007) noted that agricultural development has a very strategic meaning, not only for developing countries, but for developed countries, agriculture still receives very serious attention and protection [10]. The role of information and communication technology is very strategic in solving various agricultural problems, such as agricultural problems in the distribution of agricultural products. The real thing is experienced by farmers who have an effect on welfare if the trade system or distribution of goods can be cut. This can be seen from the results of agricultural products before reaching the hands of consumers. Agricultural products are always through intermediaries or traders. From collectors to the main market and then distributed to retailers in traditional markets. This makes the distribution line to be long. Strategic information and communication technology for agricultural problems is in line with the latest developments in the form of effective and efficient application of information and communication technology. Many experts agree that the world is on the verge of an industrial revolution. It should be noted that information technology plays an important role in all areas of human activity. In the scientific environment of economics, this phenomenon is called the digital economy [11].

Based on the McKinsey Global Institute report in the 2014-2017 period, Indonesia is the country that recorded the fastest growth in the world in terms of digital economy adoption. As a country that recorded the fastest growth in adopting the digital economy, Indonesia was ranked first in the digital economy adoption growth index calculated based on the level of digital application by individuals, businesses, and the government on three pillars. The three pillars are digital

reach (data consumption per user), digital foundation (availability and download speed), and digital value (use in digital payments or e-commerce). The score obtained by Indonesia is 99%, followed by India 90%, China 45%, and Russia 44%. According to Beske et al. (2014), research and practical applications have developed rapidly in recent decades [12]. To illustrate how sustainable supply chain management practices enable companies to monitor their supply chains and achieve competitive advantage by implementing dynamic capabilities, Beske et al. (2014) conducted a literature review focusing on the food industry [12]. In addition, a quantitative operations management approach to food distribution management has been demonstrated [13]. Within the framework of the classic first approach, the digital economy is an economy based on digital technologies and at the same time can be characterized exclusively as a field of electronic goods and services [14]. According to the World Bank definition, it is a system of economic, social and cultural relations based on the use of digital information and communication technologies [15].

**II. METHOD**

This paper use qualitative method and literature study to get the final result. This paper use descriptive method to get result of research. The source of data is from secondary data in internet. This study was held from July-September 2021. It is hoped that this paper can become the basis for further research, both empirically, descriptively, and conceptually.

**III. CHARACTERISTIC AND DEVELOPMENT OF E-COMMERCE IN INDONESIA**

Utilization of internet in business world is known as electronic commerce or e-commerce. E-commerce can reduce administration cost and business process time and also can increase relations between business partners and customers. Beside that, e-commerce can refer to paperless transaction, electronic data exchange, electronic mail, electronic bulletin board, electronic fund transfer and network based technology.

E-commerce is new approach in business world with trade acitivity or exchange of goods and services

with using internet [16]. According to Blut et al. (2015), individual or business perpetrator who involve in e-commerce, seller or buyer rely on technology based internet transaction [17].

With e-commerce, transaction can be conducted whenever and wherever to disappear geophysical obstacles. Social cultural factor also encourage the usage of communication technology and pattern of social network usage [18]. They argue that media validity can be different in several countries depend on the cultural characteristics of their countries. Collective society in Asia like India and Indonesia tend to depend on social interaction compared with the life of individualistic society [19].

**IV. OPPORTUNITIES AND STRATEGIES OF AGRICULTURAL COMMODITIES E-COMMERCE POTENTIALS AND OPPORTUNITIES**

Data from Communication and Information Ministry (2019) and BPS (2019) told that 56% of Indonesia population is social media and active internet user [20]. Beside covid-19 pandemic, since March 2020 there is the increase of e-commerce platform as many 78%. Most products which are sold dominated by drink and food products as many 27,85% from product total. Based on data released by e2eCommerce Indonesia (2020), list of market places that dominated e-commerce in Indonesia in 2019 such as Tokopedia (1,2 billion visitors), Shopee (837,1 million visitors) Bukalapak (823,5 million visitors), Lazada (445,5 million visitors), Blibli (353,2 million visitors), JD.ID (105,5 million visitors), Orami (89,8 million visitors), Bhinneka (62,2 million visitors), Sociolla (51,1 million visitors), and Zalora (44,5 million visitors).

While in Covid 19 pandemic, online transactions through e-commerce not only dominated by middle upper consumer but also by lower consumers. In Indonesia, varieties of agricultural products have been marketed through e-commerce such as marketplace, special e-commerce or social media. Some e-commerce which exist in Indonesia such as:

TABLE I. TABLE TYPE STYLES [21]

No.	Agricultural E-Commerce	Founded	Number of visitors	Website
1	Winged Bean	2015	10K+	www.kecipir.com
2	TaniHub	2015	100K+	www.tanihub.com
3	Sayurbox	2016	500K+	www.sayurbox.com
4	Simbah	2016	1K+	www.simbah.co.id
5	Limakilo	2016	N/A	www.warungpintar.co.id
6	Regopantes	2017	10K+	www.regopantes.com
7	Brambang	2017	100K+	www.brambang.com
8	Panen Fresh	2017	1K+	www.panenfresh.com
9	E-tanee	2017	1K+	www.etanee.id
10	Agripedia	2017	5K+	www.agripedia.com

<sup>a</sup> Source: Djaenuddin and Permani (2020)

Research result by Apriadi and Saputra (2017) told that e-commerce application based on marketplace could be used by farmers to market their crop directly to consumers [22]. Then the chain of marketing distribution can be shortcut that potential to raise farmers profit. E-commerce application not only involving buyers and sellers but also embroiled marketplace manager as transactions observers through verification of purchasing and sale transaction data to get better safety of transaction. Beside that consumers will access cheaper agriculture products with buying directly from farmers.

Research result from Chang and Meyerhoefer (2020) told that Covid-19 increase the sales of agribusiness products in Taiwan about 5.7% and increase the number of consumers by 4.9% [23]. The largest increase in demand for agribusiness products is for wheat, fresh fruit and vegetables, as well as frozen foods. Online sales have also increased due to social restrictions in Taiwan. Online buying and selling services will make transactions more effective and efficient

In addition, online buying and selling services are an opportunity to improve distribution channels for agribusiness products that have been done traditionally [24]. According to Rahmawati (2018), the benefits of using online transactions include reducing transaction costs, prices, and saving time, getting quality goods, and increasing global trade [25]. Some of the disadvantages of e-commerce are that this pattern only waits for the buyer, depending on the appearance of the product, and cannot try the real thing

The Covid-19 pandemic has changed consumer behavior in shopping. The results of the study by Djaenuddin and Permani (2020) stated that during the Covid-19 pandemic, consumers prioritized buying basic and health needs, avoiding face-to-face shopping, using digital payments in transactions, and reducing spending [21]. There are several advantages of e-commerce compared to offline marketing of agricultural products, namely (i) many types of products that can be marketed and sold via the internet; (ii) the place to sell is the internet which means you can sell anywhere and anytime; (iii) how to receive orders via email, telephone, sms, etc.; and, (iv) payment method by credit card, Paypal, or cash.

Behind the potential of the online market for agricultural products, the use of online media to market agricultural products also faces a number of challenges.

The results of the study of Sahara et al. (2015) stated that the challenges of developing agri-food e-commerce in Indonesia are (i) many regulations related to sales tax, income tax, ISO 27001 [26]; (ii) regulations related to financial services from the Financial Services Authority (OJK); and (iii) rules and provision of telecommunications infrastructure. In addition, unlike other industries, another challenge of online marketing is the perishable nature of agricultural products and not being able to ensure regular supply of products with standard product quality.

#### *A. Development Strategy*

By looking at the various potentials and developments of e-commerce in the Covid-19 era, a strategy is needed, both in the use of e-commerce or government policy support for further development. A person's decision to shop online is influenced by a number of factors and considerations. Factors that encourage consumers to shop online include internet access, income, promotions, prices, website attributes, and security systems

The results of research by Dinu and Dinu (2014) state that internet access has a positive effect on consumers in online transactions [27], while income factors can have a positive or negative impact on the use of online transactions [28,29]. Other driving factors influencing consumers to shop online are promotion [30], product [29,31], price [32], security system [33], and website attributes (Nurmaranti 2015). In addition, Rahmawati's research (2018) states that the reasons consumers shop online are the convenience factor in shopping (65%), quality of goods, convenience (8%), cheaper prices (2%), and other practical factors (16%) [25].

The COVID-19 pandemic has changed the behavior of people's social and economic life. The increasingly massive penetration of online access services is a very potential condition to be utilized. The ability to identify potential products to be marketed and the potential of each online marketing model is needed so that the decision to choose an online product marketing model can support efforts to increase marketing during and after the Covid-19 pandemic. There are four online marketing models to consider using. Table 4 shows a comparison of the four online buying and selling models seen from various aspects.

**TABLE II. COMPARISON OF FOUR ONLINE BUYING AND SELLING MODELS SEEN FROM VARIOUS ASPECTS [34]**

Aspects	Chatting Group	Social Media	Marketplace	E-commerce
Operating costs	low	low	medium	high
HR Needs	alone/low	alone/low	medium	high
Coverage	Local	regional	global	global
delivery,	Direct	Direct, package	package	package
Payment	COD, direct transfer	COD, direct transfer	COD, payment channel	COD, payment channel
Warehousing systems	not so necessary	not so necessary	Very necessary	Very necessary

<sup>b</sup> Source: LPEM UI(2019)

The results of the LPEM-UI study (2019) stated that the reasons for selling online were flexible business hours (63%), ease of management (58%), lower prices (49%), buyer reach (46%), and more less capital (44%). In the midst of the Covid-19 pandemic, many traditional shops were closed due to the PSBB policy so that the creativity of traders can be directed to use online media in selling is one of the opportunities.

The appropriate online buying and selling model will be obtained by understanding the characteristics of the agricultural products to be marketed, and overlapping with existing online buying and selling

models. A marketing model that is in accordance with the target market will make the targets set in the use of online buying and selling media, namely increasing sales volume and or increasing income from the farming business that are carried out can be achieved. Seeing the dynamic development of online trade, the government needs to prepare various policy instruments as regulators in this online transaction. The Ministry of Communication and Information, the Ministry of Finance, and internet server providers (ISPs) need to make regulations and roadmaps to develop e-commerce. Several aspects that need to be regulated regarding online trading are presented.

**TABLE III. SCOPE OF E-COMMERCE DEVELOPMENT SUPPORT [35]**

No.	Aspect	Program/Strategy
1	Regulation	Security rules for digital transactions, taxation, registration of business actors
2	Telecommunication infrastructure	Improved communication infrastructure (internet speed, network, and security)
3	Digital literacy	Provide education for the entire electronic-based trading ecosystem (e-commerce)
4	Start-up insentive	The convenience of digital business actors
5	Pulse subsidies	Providing subsidies and/free internet for business actors
6	National payment gateway	Develop a national payment gateway in stages
7	Incubation for novice start-ups	Develop incubation programs for start-ups to help the development of new business actors
8	National logistics system	Capacity building of the national logistics system
9	Online transaction security	Improving the application of cyber security principles by online merchants and/or operators

<sup>c</sup> Source: Perpres No. 74 Tahun 2017

### *B. Development of E-Commerce Agricultural Products Responding to the Impact of the Pandemic*

The Covid-19 pandemic has changed consumer shopping behavior from a face-to-face model to an online shopping model. Online shopping allows for a "shifting shopping habit" that requires a change in strategy from many business actors, from farmers as product providers, traders in online stalls, payment

agents, packaging, and delivery of goods. This change occurs because online shops are able to serve the buying and selling process from anywhere, anywhere, anytime, and by anyone. This model change is also a transformation of the marketing model, the communication model from direct meetings to indirect communication, and the delivery model. Regarding the products sold, e-commerce business actors are required to be able to provide their products with guaranteed quality and regular supply. Product quality is the main

requirement in order to be able to compete with fellow producers because consumers can easily trace the origin of the product and file complaints if the agricultural products purchased do not match what is available and purchased online. In addition, the marketplace and online shop will easily close their shops and reject manufacturers who sell products that are not in accordance with market quality. One of the efforts to maintain product quality in a sustainable manner is to use product certification, such as for organic agricultural products. Types of agricultural products sold online can be in the form of fresh products and processed products. The characteristics of the products sold will also have an impact on sales methods and consumer segmentation. For fresh products, e-commerce players should have a clear market share and consumers so that there is no excess stock because fresh agricultural products have the opportunity to be easily damaged (perishable). One of the efforts that can be taken is the "pre-order" system so that it can be predicted how much stock and sales volume [7]

Ultimately, e-commerce is a new commercial strategy that leads to improving the quality of products and services. In this era of the Covid-19 pandemic, e-commerce players can focus on their business development strategies through (1) quality assurance and continuity of agricultural products sold, (2) ease of application and payment features, (3) competitive selling prices, (4) quality of packaging and delivery of goods, and (5) customer service.

### *C. Challenges of Digital Economy in Agriculture*

Apart from advances in information and communication technology, the digital agricultural economy raises a variety of problems. One of the problems in the development of the digital agricultural economy is the unmet availability of agricultural products. Although the scope is wide, the fulfillment of needs is not necessarily achieved. The majority of consumers want to immediately get agricultural products, but the availability of agricultural products that are not necessarily there is a separate obstacle. This correlates with the shortcomings of the digital agricultural economy which in its implementation is less than optimal in managing human resources. Farmers are currently still focused on the cultivation process, so they do not understand the concept of digital agricultural economics. This is a real challenge and complexity for planning future workforce capabilities in the digital economy; such as the ability to integrate the right people and gain new digital competencies to drive transformation. In addition, farmers who have not been able to manage applications so that there is not necessarily an update on agricultural products and the prices offered. Farmers generally only focus on the production process, sometimes forgetting about the downstream process, which is actually very broad in scope. Technically, farmers have not been able to estimate accurately the resulting agricultural products

so they cannot recapitulate the results of agricultural products.

When viewed from a consumer perspective, although it is considered easy to use smartphones, especially young people, access to the digital agricultural economy in the form of websites and applications is still minimal. This means that applications that are suitable for the needs of agricultural products cannot be found quickly. This is related to the problem of information on agricultural needs. In the global digital economy, consumer needs are becoming more diverse, resulting in inaccurate and insufficient consumer needs. Still in the problems faced by consumers, the need for agricultural products is desired quickly, but the response of farmers who are not fast enough causes the need for agricultural products to be constrained. On the other hand, nowadays more and more farmers are getting old. Meanwhile, the interest of young farmers began to decline along with the development of other employment options. This makes the difference in the distance between old farmers and young farmers higher, resulting in an impact in the form of a lack of interest in utilizing the digital agricultural economy. From the results of the analysis in terms of the readiness of agricultural products, the obstacle that arises is that farmers do not yet have the support of infrastructure that suits their needs. In supporting the process towards a digital agricultural economy, infrastructure facilities other than smartphones are needed, it does not rule out the possibility of other needs. The readiness of farmers to welcome the digital era is still very minimal and less than optimal in terms of technical readiness. Farmers as producers consider that the digital agricultural economy has a complicated process starting from taking pictures, inputting into applications, to setting prices. This will reduce the interest of farmers. This is also in line with the needs of farmers in utilizing the digital agricultural economy in the form of infrastructure facilities in the form of platforms payment used. With the digital agricultural economy, of course, farmers will also make transactions in digital form. Farmers are considered still not interested in the digital agricultural economy in the form of applications. Sometimes, farmers still can't see the right needs even though they already have a smartphone.

### V. CONCLUSION

The Covid-19 pandemic has resulted in changes in consumer shopping behavior. The government's policy of 'lockdown' or 'semi-lockdown' (PSBB) has increased the number of transactions for agricultural products through e-commerce. The implementation of e-commerce will make transactions more effective and efficient, improve distribution channels for agribusiness products that have been done traditionally, and reduce transaction costs, prices, and save time. The potential for e-commerce development is driven by the factor that 64% of Indonesia's population are active

internet and social media users. The average Indonesian has more than one smartphone, and throughout 2020 there was an increase in the number of e-commerce platforms by 78%. For the development of online shopping, several things that need to be considered include the types of products sold, target market, regularity of product supply, volume of products produced, sellers, internet network quality, sales volume vs. profit margins, and competitors for the same product. The challenges of e-commerce development include the high investment in telecommunications infrastructure, consumer digital literacy, including online payments, electronic wallets, the need for regulations related to online transaction taxes, income taxes, ISO 27001, and the need for regulations related to financial services from the OJK. Thus agriculture can be improved significantly through digital economy although there are many challenges lie ahead. The welfare of farmers in using e-commerce to sell their products can be raised directly.

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