Volume 1, Issue 1, 2024

Development of Digital-Based Economy in Indonesia

Ramadani Kurniawan[1*], Ardelia Emily[2], Mega Siti Fasicha[3], Purwadhi Purwadhi[4] , Rian Andriani[5]
[1] Master of Management, ARS University, Indonesia,
aaa7xxx@gmail.com

ABSTRACT

Introduction : The development of the digital-based economy in Indonesia has shown significant improvement in recent years, especially in the context of recovery after the COVID-19 pandemic. Economic digitalization not only encourages the growth of the information and communications technology sector, but also plays an important role in increasing national competitiveness and supporting sustainable development. Several digital-based economic changes in Indonesia such as E-commerce, digital SMEs and digital banking services. This research aims to analyze the impact of digital transformation on Indonesia's economic growth, with a focus on technology adoption by business actors, the role of government in supporting digital transformation, as well as the potential contribution of the digital economy to post-pandemic recovery and achieving sustainable development goals.

Research Methods : The method used in this research includes analysis of secondary data in the form of theory, official government reports and empirical findings from previous research obtained using literature studies.

Finding / Result : The findings reveal that although Indonesia has substantial potential in the digital economy, challenges remain, such as uneven digital infrastructure and limited access to technology in certain regions. Moreover, digital transformation has the potential to become a key pillar in achieving sustainable development goals by accelerating post-pandemic economic recovery. These insights are essential for policymakers and industry players to optimize the potential of the digital economy in Indonesia in support of sustainable development.

Keywords: Development, Digital based Economy, Post-Pandemic Recovery
JEL Code: O33, O53, I15, Q01

INTRODUCTION

New communication, information and media technologies that have succeeded in changing communication patterns and information search have become factors that contribute greatly to changes in people's lifestyles, especially in communication styles and information search. Ita can easily get information about anything. The internet also allows people to communicate with each other using email facilities, social media, and so on. Along with technological advances, the economic sector also contributes to the welfare of the community. With matters related to the economy, currently it has begun where the era of the world economy can develop rapidly and economic flows between countries can be easily accessed

The digital economy is transforming the global economy, allowing small industries to become micro-multinational industries with their elasticity and dynamics. This gives a higher chance for startups to be born globally, digitalization encourages competition as it enables innovative business models and allows companies to scale up quickly. Tens of millions of small and medium-sized companies around the world have turned into exporters and joined the e-commerce market, and can compete with the largest multinational corporations.

The digital economy continues to develop in the country, even Indonesia is considered to have great potential because the penetration rate of internet users continues to increase. In 2017, the number of internet users in Indonesia reached 143.26 million, an increase of 7.96% from 132.7 in 206. In 2017, the number of internet users accounted for 54.68% of Indonesia's total population of 262 million. The Government of Indonesia in the era of President Joko Widodo, Indonesia targets Indonesia to become the largest digital economy power in ASEAN by 2020. The volume of e-commerce transactions is estimated to reach 130 million US dollars.

LITERATURE REVIEW

Definition of Economics Digital

The term digital economy was introduced by Don Tapscott in 2003. 1995 through his book entitled The Digital Economy: Promise and Peril in the Age of Networked Intelligence.

Economy digital is activity economy Which based on ontechnology digital Internet. Economy digital called Also with internet terminology economy, web economy, digital-based economy, new knowledge economy, or new economy (Hartono, 2016) . The digital economy era or new economy era emerged whenorganization start to marry productivity IT from source Power assets with knowledge from source Power man For reach transaction global crosslimit in connected form economy. Temporary That, draft economy digital According to (Zimmerman, 2000), it is a concept that is often used for explain impact global to rapid development Technology Information And Communication that impacts socio-economic conditions. This concept becomes a views on the interaction between innovation development and technological progress Which impact on economy macro and also micro. Sector Which influenced coveringgoods and service,

According to Don Tapscott in (Hartono, 2016), the digital economy has 12 attribute:

1. Knowledge. In the digital economy, the power of knowledge is translated into superior innovations through the latest opportunities to create superiority competitive.
2. Digitization. Transaction business using digital technology and digital information. Customer interpreted as digital customers use digital devices For do transaction with companies seller goodsAnd service as digital enterprises.
3. Virtualization. In the digital economy it is possible to transform physical goods into virtual ones. goods virtual, capital intellectual converted become capital digital.
4. Molecularization. In economics digital, heavy organization in traditional organization transformed into a flexible light organization, M-form organization (organization multidivisional) shift become E-form organization or ecosystem form organization Which adaptable with environment.
5. Internetworking. Use network Internet to build interconnection to form economic network.
6. Disintermediation. No required Again intermediary, transaction can done direct peer-to-peer.
7. Convergence. Convergence computing, communication, And content together to form interactive multimedia Which become the platform that important.
8. Innovation. Imagination And creativity man is sources markmain to form innovation economy.

9. Prosumption. On era before economy digital aspect key is mass production, currently in economy digital is mass customization. Difference between producer And customer become blurry, every customer in information highway canAlso become producer.
10. Immediacy. The difference in time between ordering goods and when they are produced and sent shrink in a way drastic due to speed process digital technology.
11. Globalization. According to Peter Drucker "knowledge knows no boundaries." There isn't anylimit For transaction global.
12. Discord. Will appear canyon separator between Which understand technology with Which No understand technology. So that survive, all player in economydigital must have technologically literate abilities, namely being able to follow technological shifts towards interaction and integration in the form of internet worked economy.

Internet As Need

The internet has become a necessity for many people's lives. In the COVID-19 pandemic, 19, for example, the role of the internet is very much needed when everyone has to stay at home. home, work and study from home. Therefore, the existence of the internet is necessary re-positioned, especially in relation to citizen rights. In particular Globally, internet access has been recognized as an achievement that must be pursued by every country. This is reflected in the Millennium Development Goals (TPM) 2000– 2015 And more and more pushed in Objective Development Sustainable (TPB) 2015–2030(Bachtiar et al, 2020).

According to Edwards (2012) Internet contain meaning "transformative". Internet give chance on all person For use right to argue Andparticipate to progress public. However on the contrary If No There is Internetwill disrupt community activities in carrying out their activities, for example from education and employment aspects 2020. Jalli (2020) also revealed the important role Internet on process learning during time pandemic COVID-19. Quality learning and abilities of students who have limited internet connections will lagging behind when compared to students who have better internet access. Access Internet more appropriate as right inhabitant country Which provision guaranteed by government. So, his affirmation precisely located on obligation government For expand access Internet, build network, And stage literacy digital2,especially for the community which so far neglected.

The Gap Digital

Term gap digital First time appear on year 1990, term gap digital used For describe gap information, knowledge, skills in use computer, or literacy media (VanDijk, 2006). At that time, the issue was only about the presence or absence of access. to equipment, Information Technology and Communication or internet connection. Ferro, Helbig, and Gil-Garcia (2006) stated that the digital divide is not just the question of “who can connect with Internet," but Also "What Which person do, or What Which Actually Can person do,when use Internet".

The digital divide is more often discussed in relation to the availability of the necessary facilities and infrastructure and digital literacy. Geographical aspects are often highlighted by for academics. For example is English And Tampubolon (2016) Whichprocessed Susenas 2010–2012 data and found a strong spatial influence indigital divide. The digital divide occurs between villages and cities, and also between land and island areas. The model they developed shows thatdisparity infrastructure telecommunication, source Power man (HR), And facility education correlated with the digital divide.

On dimensions socio-economic, Suwana And Lily (2017) highlight existence the digital divide is caused by differences in abilities between men and women. women. This difference is seen in digital media literacy. Although women are active internet users, their digital literacy is still low because low levels of education, limited facilities and training, and the continued strongculture patriarchy.

A studies other by *Center for Digital Society* –University Elephant Mada (CfDS–UGM) show that majority (62.5%) partner Woman it turns out No have access to the internet (Angendari, 2020). In addition, those who do not havemobile phone clever most aged old, No Once go to school, or only finished SD.

According to Wikipedia accessed January 19 2020, it is knowledge and skills For use media digital, tools communication, or network in find, evaluate, use, make information , And take advantage of itin a way Healthy, wise, intelligent, careful, appropriate, And obey the law in frame fostering communication and interaction in everyday life. Digital literacy also is the ability to use information and communication technology (ICT) to to communicate content/information with skills cognitive And technical.

The study concluded that the biggest barriers to internet and ICT access somebody is (i) person Which concerned No feel that access Internetor ICT That beneficial, (ii) its use considered No easy, And (iii) person Whichconcerned No have time For Study use it.

Onitsuka, Hidayat, and Huang (2018) looked at how the internet is used in Tumpukrenteng Village, Malang Regency. This village has a young population that big. Onitsuka, Hidayat, and Huang found that age is a determinant the main digital divide. In fact, the digital divide among young people Also determined by variation age they. The researcher Then conclude thatThe younger a person is when they first become acquainted with the internet, the more consistent they are. will use it later. Furthermore, age also influences motivation and skills in using the internet. The internet can influence communication And participation so that can bring impact positive for inhabitant village.

Dimensions Socio-Economic And Geography

Dimensions socio-economic And geography more important For describe conditiongap digital in countries develop. Technology back to predicted asroad For going to public Which open. Prediction This get Lots criticism inpractice use technology Also hampered by factor socio-economic, like gender, race, and social hierarchy. Only the elite can use technology. By Because That, utilization technology precisely make Which rich more and more rich And Whichpoor more and more poor. The main thing is, gap digital can widen gapsocial.

Willis and Trenter (2006) examine the impact of the internet in Australia: does the internet encourage the creation of an equal society as described by the theory diffusion technology or precisely widen gap digital. His findings show that on stage beginning utilization Internet, draft gap digitalhappen Because only race elite Which Can access it. However, on stage next time the cost of internet connection and hardware prices become cheaper, The theoretical picture of technology diffusion will occur. Although it is not exactly the same as the concept digital divide, social barriers to internet use persist. As example, access Internet Can different when factor gender interacted with characteristics type work, class social, And difference location.

Study which is relevant

A study conducted by Bachtiar et al. (2020) from *the SMERU Research Institute* found at least four reasons why the digital economy in Indonesia has not yet contribute real to growth economy national. First, even though growing rapidly, the number of internet users is still low, even still in below the Millennium Development Goals (TPB) target, namely 50% of the population. Second, access Internet Still Not yet evenly based on region, gender, level

welfare, education level, and business sector. For example, only 2% of the entire workforce in the agricultural sector uses the internet, even though the number Workers in this sector account for 27% of the total number of people working in Indonesia (Sakernas 2019). Third, Internet Still considered as means communication and entertainment only. So far, the internet has not been considered as a business tool in general. Fourth, the digital economy in Indonesia is only in its early stages. The stage digitization And digitalization Not yet happen in a way comprehensive And utilization data Not yetoptimal for making strategic decisions that can change the culture of the institution so that produce revenue stream new

The annual report produced by Google, Temasek, and Bain & Company " e- Conomy SEA 2020 " which reviews the development of digital or internet business in Asia Southeast. Time This, title Which taken is " *At full velocity: Resilient and RacingAhead"* — indicates how ambitious digital players persist and try guard growth in middle downturn economy global. There is 7 sector digital Whichhighlighted. Besides Which Already There is previously, namely e-commerce, transportation & food, on linetravel, online media, and financial services; this year the research added two landscapes new businesses namely healthtech and *edtech* — because both are experiencing growth significant in middle Covid-19 pandemic.

The pandemic also encouraged internet user penetration in the region, it was recorded that there were around 40 million new users in 2020. So that in total in Southeast Asia There is around 400 million user Internet — equivalent with 70% from total population. The existence ofrestrictions social to form culture new like activity work/school from House, impact on the consumption of digital services has increased drastically. One thing that interestingly enough, in Indonesia 56% of the total consumers of digital services this year come from outside the metro area, while the remaining 44% are still from around the metro area. So that Can it is said, until moment This development digital of course Still Jabodetabek-centric; and that is undeniable because it is viewed from the accessibility point of view. infrastructure does have a significant gap between metro and non-metro areas. metro (https://dailysocial.id . Accessed 19 January 2021)

Study other Which done by Febriyantoro And Arisandi (2018) describe impact digital marketing to volume sale for perpetrator UMKin Batam city. This research is qualitative, using a triangulation model,Which merge method interview structured, interview deep And observation to perpetrator MSMEs Which registered active in Service Empowerment Public Market – Cooperative And Business Small And Intermediate City. From results studyknown

that digital marketing make it easier perpetrator MSMEs For give information and interact directly with consumers, expanding market share market, increase awareness and increase sales for perpetrator UKM.

Idah and Pinilih (2019) UMKM (Micro, Small and Medium Enterprises) in Indonesia become Wrong One sector business Which Enough dominate run by perpetrator business. However, MSMEs face challenges in facing digital competition in field business so that capable endure in middle competition. So from That, objective study will identify strategy development digitalization MSMEs in Indonesia. Method Which used is analysis SWOT with see factor external and internal factors that can influence the development of MSME digitalization. The results of this study are the calculation of *Internal Factor Evaluation* and *External Factor Evaluation* with a value of (0.05; 0.1) which means that the position of the condition of MSMEs digital-based in Indonesia is in quadrant I. In this position, in order to be able to develop digitalization MSMEs in Indonesia, so priority strategy is increase share market to Outside Country (S2,S3,S4,O3,O5), add unit production and improve product quality (S3, S4, O1, O2, O4), improve the processmarketing online (S2, S4,O3, O4).

Study Which done by Ministry of Communication and Information (2019) show that with use analysis SWOT show that strength economy digital in Indonesia is: 1) digital infrastructure and access have been well established in Indonesia; 2) opening the door to collaboration between ministries, institutions, businesses and private For develop economy digital; 3) pyramid population in Indonesiadominated by young people; 4) Indonesia's target is to become the world's *e-commerce center* In 2020; 5) the number of internet users in Indonesia is ranked among the top 5 in the world. The weaknesses are: 1) there is no inclusiveness in the use of ICT for activities. production; 2) the ability of human resources to adapt to digital developments is still is relatively low; 3) policies and regulations that govern the digital economy are still sectoral in nature; 4) The existing platforms do not yet take locality into account; 5) the Indonesia and the current supply chain system and value chain of digital products inefficient. The opportunities for the digital economy are: 1) high interest from foreign investors to enter the Indonesian digital market; 2) Technological innovation that supports the economydigital enters Indonesia massively; 3) potential for managing workers' remittances Indonesian migrants are still very large. While the threats are: 1) the high *abuse opportunity* in the digital world; 2) the entry of similar products from abroad with

price Which more cheap; 3) Power bid buyer tall; And nerves center platform Which There is moment This all in outside country.

Recommendation strategy Which proposed Ministry of Communication and Information (2019) is: 1) developpolicy *end to end business* through approach research action collaborative multi-party Which taking into account the uniqueness and diversity of Indonesia. 2) strengthening governance development of a local-based digital economy in an implementative context synergistic; 3) push birth platform And creator product digital in scale regional.

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RESEARCH METHODOLOGY

The methodology of this research uses a systematic review method. To conduct an evidence-based systematic review, data collection is carried out through articles related to the development of the digital-based economy in Indonesia. The study presented in this paper is based on relevant literature analysis. This study aims to analyze the impact of digital transformation on Indonesia's economic growth. The articles selected based on the inclusion criteria that have been determined are research journals that discuss digital-based economy, economic growth. Researchers also use source triangulation, i.e., comparing data from different sources and data collection techniques, to ensure the validity and validity of the findings.

RESULTS AND DISCUSSION

1. Benchmaking Economy Digital

United States of America is one of the the country that very visionary in beginning era Internet. In 1998 Bill Clinton passed *the Digital Millennium Copyright Act* (DMCA). Through this regulation, various innovations were created, such as *eBay* and *YouTube* . DMCA regulations protect not consumers but protect innovation. Where protect immunity on owner platforms. The perpetrator is Amazon, Googleand Facebook.

The Chinese government is so protective that it filters access to sites from outside. However The Chinese government is able to force foreign investment to enter there with a value hundreds million dollar. Government Also Can interesting return for engineer Which go to college inAmerica or wherever to return to their country, build a field work And Also building technology startup. Alibaba Players

India For decades, known as a destination for outsourcing. Prime Minister India Narendra Modi try invite Lots investors foreign so that Can increasing the number of local entrepreneurs who compete globally. As a result, Amazon hasopening offices in India and pouring billions of dollars there. The latest is Softbank Which has committed invest as much as Rp 130 trillion in India. The perpetrator Flipkart, Inmobile and Snapdeal.

South Korea, the South Korean government's efforts to build infrastructure as they was chosen as the host of the 2002 World Cup. The government wanted news from Korea to be spread throughout the world quickly. They poured massive investments For

infrastructure Internet. The result Now, they become country with penetration Internet most tall in world. Not only question access, But Also question speed.

2. Development Economy Digital in Indonesia

Indonesia's digital economy prospects are huge, according to Google, Temasek, and Bain & Company (2020) noted that there were 202 domestic digital investment agreements. in the first semester of 2020. The total value was USS 2.8 billion or around Rp 39.4 trillion. Up 55.6% from period The same year previously And become Which highest in Asia Southeast. Analysis report the state, mark investment Which big show investors want return results big in term long Andsustainable. Different from before which expected super results fast or term short. Report Which The same Also project mark economy digital Indonesia reach US$ 44 billion on year This. Projection For 2025 even reaching US$ 124 billion or around Rp. 1,744 trillion. Far behind Asian countriesAnother Southeast Asian country that could only reach US$ 22 billion-53 billion in five years upcoming.

One of the driving factors is the growth in the number of internet users. domestically which continues to increase. Association of Indonesian Internet Service Providers (APJII) in the survey take notes amount user Internet on 2019-2020 reach196.71 million or equivalent to 73.7% of the total population of 266.91 million people. Increased from 2018 which was equivalent to 64.8% of the total population. The Covid-19 pandemic also jack up growth user service digital Indonesia. EnforcementLarge-scale social restrictions (PSBB) encourage people to switch to platforms digital as solution from limitations mobility. Google, Temasek, And Bain & The company noted that 37% of total domestic digital service users were new. From all over user new the, majority or 56% originate from region nonmetro. This means that the distribution has started to spread evenly to rural areas. In accordance with target government For more to popularize service digital through development of internet infrastructure, such as the Palapa Ring which was completed in year 2020 (Ridoy, 2021)

Indonesia is Wrong One country Which own potential big For development economy digital. Google And TEMASEK (2018) in results his research, states that one of the things that supports the development of Internet And economy digital in Indonesia is the amount amount user Internet inIndonesia. Some other facts that support the development of the digital economy in Indonesia between other as follows (McKinsey & Company, 2018):

1. Indonesia is estimated to have an *online trading market* of 5 billion trading on line formal, And more from 3 Billion For trading on line informal.
2. Indonesia estimated own 30 million buyer *on line* on year 2017 with totalpopulation around 260 million.
3. By 2025, the digital economy in Indonesia is expected to create 3.7 million work addition.
4. Generate up to 80% higher revenue growth for small businesses And intermediate (UKM).
5. Give addition 2% per year in growth GDP with increase the level of *broadband penetration* and the use of digital technology by UKM.

3. Provider *E-Commerce* in Indonesia

According to Kominfo.go.id accessed on 20 January 2021 There is a number of provider *E-Commerce* in Indonesia including:

1. Kaskus own *daily page view* : 3,283,582, total user 5 million, mark transaction $ 60 million (Rp 575 billion) per month. Amount visitor 22 million pr month.
2. Lazada has 414,781 *daily page views* , average transactions: 3000 transactions per day. Getting investment from JP Morgan, Kinnevik, Summit Partners and Tnggelman up to more from 1 million USD.
3. Bhinneka, which has *a daily page view of* 281,090, a transaction value of 300 billion in year 2012, number of transactions 300,000 transaction.
4. Tokopedia with *daily page views of* 212,642, transaction value of Rp 6 billion/month. 9000 shop active registered. There is 200,000 type product.
5. Zalora *daily page view* 116,266, number of transactions 2000/day, 500 brands and 25,000 types of products, mark transaction 48 also Euro.
6. Berniage with *daily page view* 596,529 with amount advertisement 893,218 advertisement

4. Changes Business Model.

Study Which done Ministry of Communication and Information Year 2021 shows existence change model business per sector, following served example change business in sector transportation.Table 1. Show change model business in sector transportation. Change modelbusiness from model long (old), *new model* or model new (existing) Which currently walkand *future models* or future models. There are three basic things about business transactions that changed that is: transaction information, transaction finance And transaction goods And changes in business models in the agricultural sector. These changes include the types of information what is needed, sources of information, how to order, business flow and characteristics business. As example presented changes business sector transportation.

Table 1. Change Business Transportation

	Old	***Existing***	***Future***
Type Informatio n	1.Route/destination 2. Rates transportation	Identity driver And vehicle. tracking location driver And passenger (exampleGrab And Gojek) rates transportation	*Offer solution approach* through service intermodal
Somber Informatio n	Station (land, sea,air) Pool (base) 3.Company Provider Transportation4. *Word of Mouth*	Company media *(call center, website, on line newsletter* for members)ex: advertisement promotion	1. Location real time all overtype of transportation (including bus, mrt, krl) based on GPS 2. Time estimation arrival in each station 3.rates
Method Order	1.Come direct2. *Call center* 3. Agent journey	Mobile apps	1. *Website 2. Mobile apps* *3. Integrated order*
Channel	Company transport, station, agent, passenger	Company transport,*on line travel agency* , passenger	There are two types 1. Government, Driver 2. Owner Vehicle, Service Company

			Transportation On line And Passenger
Characteristic features	Location servicein place certain Company musthave the means transportation Means of transportation including driver is atin lower One entity	*On line Travel Agency* Company Service Transportation On line (PJTO)	Type 1 Objective: in city Commuter Line,MRT, Transjakarta, APTB. Condition: public transportation andminibus that doesn't government managed abolished Type 2. Model *ridesharing* Example: GrabCar, UBER,Go Car

Source: Ministry of Communication and Information (2021)

Sector finance is Wrong One sector industry Which experience developments along with the development of Information Technology and Communication (ICT). The banking industry is one of the industries that relies on ICT for services to its customers. Call it *SMS banking* , *mobile banking services* (m-banking), and *internet banking* (i-banking), which have been around for several yearsThis become Wrong One product service Which given by industry banking. People have also started to become accustomed to using financial services. based on digital technology (Kominfo, 2019).

Along with the development *of startups* in Indonesia, many *startup players* are... develop application service finance based on technology. Development industry *fintech* become the more diverse, And No only on application service banking.

Industry *fintech* in Indonesia develop in field service finance payment (payment), funding, banking (digital banking), market capital (capital market), insurance (insurtech), and other financial services support services (supporting fintech). Currently, the number of *fintech*

organizers in Indonesia is the largest on service sector payment finance (payment) and funding (lending).

along with the following financial sector developments explained the changes Payment method Table 2. explains if previously using cash payment method and now Cash and Non-Cash (ATM, Transfer, Credit Card, *m-banking, e-banking, e-money)* . So on time Which will come method pay done with Non-Cash or Cashiess (ATM Transfer, Credit Card, *Payment Gateway, e-banking, e-money, EDC mobile) Near Field Communication (NFC), QR Code.*

Table 2. Transaction Financial (Method Pay)

Old	Existing	Future
Cash	Cash And Non-cash (ATM, Transfer, Card Credit, m-banking, e-banking, e-money	Non-Cash or Cashiess (ATM Transfer, Card Credit, Payment Gateway, e-banking, e-money, EDC mobile) Near Field Communication (NFC), QR Code.

Source: Ministry of Communication and Information (2021)

In general, the *fintech industry* in Indonesia can be grouped into 3 (three) group, that is:

1. Payment systems are developing as a means of non-cash payment which can be used for transactions with *merchants.* Examples: OVO, Go-Pay, Funds, LinkAja.
2. Funding/financing (lending), For perpetrator *fintech* in field *lending* in Indonesia, in group into in some parts, that is:
   a. *Peer-to-peer lending (P2P Lending),* a platform that connects borrowers (debtor) And person Which borrow funds (creditor). Example: My capital, Investree,Amartha, KoinWorks.
   b. *Balance sheet lending* , a platform that provides loans directly from fundsthey Alone. Example: Money Friend, Julo, Cash We, Doctor Rupiah
   c. Online loan providers (online credit), platforms that provide facilities credit for transactions made online. Examples: Akulaku, Kredivo, Installment.
   d. Provider loan on line mechanism pawn, platform Which give loan funds with mechanism pawn. Example: Borrow.

Other fintechs, *fintech platform organizers* outside of payment systems and funding. On group *fintech* other This, organizer *fintech* Which canit is said Enough develop is organizer *fintech* in field *crowdfunding* And*digital banking* . Example: Kitabisa.com, Genius by BTPN, Digibank by DBS.

5. Change Model Business Sector Agriculture

The development of technology in various sectors encourages the growth of technology in sector agriculture. Part farmer has changed bow from pattern agriculture conventional, to a digital farming pattern that is in line with current developments. A number of *Startups* in Indonesia see this problem and try to develop it. industry agriculture in Indonesia. Technology Agriculture 4.0 is phase agriculture that ispractices, methods and techniques are based on digital technology, including technology Information And Communication (ICT) as well as Internet. Every the process integrated And directly connected to external parties, through data transmission and communication to become automation and autonomous systems. Referring to the meaning of the word agriculture, it means The scope of agriculture in agriculture 4.0 is the agricultural value chain. The elements technology in agriculture 4.0, in accordance with the value chain, including; biotechnology and genes, agricultural technology, food technology and *e-commerce* for food products and foodstuffs.

Era agriculture 4.0 is era agriculture when perpetrator agriculture can interact directly with every node of the value chain, consumers, suppliers, distributors and also retailers, Where every his activities recorded so that can done prediction,measurement and search, with the system control automatic and can done with distance Far. Draft development agriculture Which Lots developed on currently is the concept of smart farming, which is also commonly called *smart farming* or *precision agriculture* . Draft This refer to on implementation ICT field agriculture. Objectivemain implementation technology the is For do optimization in the form of increasing results (quality and quantity) and efficiency of resource useThere is (Communication and Information) 2019).

6. Challenge Economy Digital in Indonesia

The challenges faced in the financial sector, with the presence of fintech, are public Which including in *unbanked* population start can feel facilityservice finance. Matter This Of course impact positive Which happen Because innovation product digitalin the *fintech*

industry . However, within the *unbanked population group* there is a group communities who work in the micro-agricultural sector and live in rural areas, who have not yetfully accessible to financial service providers including *fi- ntech* . Therefore, financial service providers in the *fintech industry* still need to do development so that the product can utilized by group the community. *The fintech platforms* that exist to date are still general, so that need developed policy *end to end business cycle* Which related to the local values of Indonesia. The development of *fintech platforms* does not have to always packaged on a large scale, it is also necessary to develop a large-scale *fintech platform* local so that facility Which given accordingly with need public local.

Challenges in the agricultural sector Based on the population pyramid, Indonesia will face problem employment For group young. Economy agriculturedigital is predicted to be able to drive acceleration in preparing young people. In the process of farmer regeneration. This means that they are not traditional farmers, However become CEO business agriculture with base digital. It is estimated, without do matter the, so interest For develop sector agriculture will lost and will become a serious threat to Indonesia's food security in the future. Upcoming.

7. The problem Economy Digital in Indonesia

The problem economy digital grouped become: 1) problem Which faced by startup; 2) problem sector financial 3) problem in sector agriculture; 4) Consumer protection issues; 5) Problems arising fromcharacteristics of the digital economy itself; 6) Digital Economy Problems According to ResultsStudy Ministry of Communication and Information (2019).. The problem the can outlined in lower This

According to the research results of the Puslitbang Aptika and IKP (2016), the problems that... faced statusup is as following: 1) Funding; 2) Networking , 3) Solidity Team; 3) Trial and error, lack of experience; 5) Market: not accepted by the market, the market is not ready, habit (culture) And target No appropriate And regulation; 6) Investment foreign And processlong time. Meanwhile, **the problems in the financial sector,** in addition to the organizers of the financial instruments payment Which diverse, *platform fintech* with service service finance financing too will the more Lots popping up. Year 2018 Ministry Communications and Information Technology closed 385 illegal *fintech platforms , and in 2017* 2019 OJK found that there were approximately 144 illegal *fintech platforms* . This

shows that the development of the financial sector, especially in financial services financing, in the digital economy era, allows for *abuse opportunities* to occur leading to criminal crimes in the digital world. To anticipate this, literacy related service service finance in era economy digital This even need emphasized Andbecome attention to public (Ministry of Communication and Information, 2019).

The problem Economy Digital Sector Agriculture including:

1. The problem HR, part big farmer aged more from 40 year And more from70 percent farmer in Indonesia only educated equivalent SD even in underneath.Education formal Which low the cause knowledge in agricultural processing is not developing and is monotonous. Farmers only process agriculture like usually without create innovations latest for the sake of improvement abundant food yields.
2. Condition of agricultural land, In reality the distribution of population and development in Indonesia is not yet fully even. This is proven with Still the amount "Land Sleep" or land Which Not yet worked on by public in areas interior, temporary, land in a region strategic precisely to be fought over at a price expensive.

On system diversion technology from traditional become modern in management agriculture Not yet can accepted in a way wide by for farmer Which StillMany choose to use traditional equipment. Apart from the limitations cost, limitations knowledge Also become factor Which hinder rate technology to penetrate the agricultural sector widely. This problem also caused by the existence of a digital divide between urban and rural communities rural, Where for farmer generally is at in area rural. On countrydeveloping like Indonesia, information technology infrastructure is not evenly distributed all over region. Infrastructure technology information, like access telecommunication And internet can only reachable in urban areas. Thus, adoption technology part big only can felt by public urban. Rural communities, including farmers, have not yet been able to feel the impact directly. maximum, even in a number of area certain untouched The same very.

Economy digital Also face problem protection consumer.Consumer protection in digital economic transactions is still weak, consumers do notknow the path to make a complaint and the rights that are owned. However, happen improvement complaint consumer Which significant from year to year. The problem Also happen as consequence from Characteristics Economy Digital. Economic characteristics digital in Indonesia result in problem including:

1. Uncertainty object And subject tax, decrease intermediary, transaction finance No fully monitored And territoriality of law between country.
2. *E-commerce* fraud , transaction security, false information e.g. fictitious tokens, goods No in accordance, up to data security personal.
3. Make it easy the occurrence acquisition foreign *e-commerce* or *startup,* Not yet There is database *e-commerce* , ecosystem startup Not yet ripe And the occurrence mismatch between *zone improvement* (ZIP), No in accordance with development region.

Results Study Ministry of Communication and Information (2019), analyze problem Which faced digital economy is 1) the lack of inclusiveness in the use of ICT for activities production; 2) the ability of human resources to adapt to digital developments is still is relatively low, this is influenced by age structure, education level and type sex; 3) policy And regulation Which shelter economy digital Still naturesectoral; 4) *Platform* Which There is moment This Not yet consider importance locality, Indonesia with the vast area, geographic and demographic structure encouraging the need for flexibility about locality; 5) Indonesianness and the supply chain system and product value chain digital that exists at the moment This No efficient.

8. Recommendations

The digital ecosystem related to the financial sector needs to be equipped with only with intelligence artificial (artificial intelligence), but Also intelligence contextual intelligence. In addition, for the development of *fintech platforms* Locally based research and pilot development actions related to *nerve need to be carried out. system (NS) and* local-based intelligent decision support system (IDSS) based).

Moment This of course Lots Platform agriculture Which develop, sadly platform the Still limited to facilitate operational on side trading trading of various commodities. Opportunities for increasing the digital economy will be greater increases if all sectors implement *e-commerce intelligence technology,* mechanism *supply chain,* and also system logistics Which adequate. Besides That development economy digital No only related with implementation technologybut also through improving the quality of human resources. Therefore, development economy digital customized with diversity progress between region in Indonesia from side Technology And HR. No all region have speed Which The same in apply Technology 4.0, Good from aspect production, ethos Work, untilmarketing product.

With thus, development economy digital need approachsocial, in the form of Variety literacy digital based on region.

Based on the characteristics of the digital economy and the problems faced, recommendation what is proposed is:

1. Repair infrastructure Supporter economy digital Which more and more inclusive And take sideson public weak in terms of economy;
2. Management sector taxation Which take sides on perpetrator economy digital Because prospects economy digital which is very big;
3. Protection consumers and socialization rights as well as complaints procedure And completion;
4. Penetration *e-commerce* For public Which Not yet affordable Because structure geography And demographics specifically public weak;
5. Change model business: and
6. standardization service logistics.

Conclusion

The development of the digital-based economy in Indonesia shows promising growth, driven by increased internet penetration and digital transformation across multiple sectors. However, challenges remain, such as unequal digital infrastructure, limited access to technology in certain regions, and the need for greater digital literacy. The digital economy has significant potential to support Indonesia's post-pandemic recovery and achieve sustainable development goals by fostering innovation, improving national competitiveness, and increasing economic inclusivity. Continued collaboration between the government, private sector, and communities is essential to maximize the benefits of digitalization, especially in addressing the digital divide and optimizing digital infrastructure and human resources. By focusing on these areas, Indonesia can further enhance its position as a leading digital economy in Southeast Asia.

Acknowledgement

We would like to express our sincere gratitude to all those who contributed to the completion of this study. Special thanks to the faculty and staff of ARS University for their guidance and support throughout the research process. Finally, we extend our appreciation to our colleagues and fellow researchers for their constructive feedback, and to our families for their constant encouragement.

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