Digital Utilization for Rural Economic Recovery: Village Adaptation and Strategy

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Abstract. The use of digital technology in people's lives for productivity and financial services has reached rural communities, the increase in digital transactions during the Covid-19 pandemic shows how people adapt to current changes and utilize digital technology as a strategy to village economy recovery. This study seeks to identify the use of ICT in rural areas and discover economic recovery strategies. This research was conducted using qualitative research methods with a case study approach. Data collection using focus group discussions, interviews and analyzing the report data. Data from the literature will be confirmed with conditions in several villages in Indonesia. The villages were chosen based on their activities in using technology, especially digital technology in economic activities. This is a strategy in recovering village economies through digitization or the use of ICT in economic activities that have an impact on the community's economy. The study shows that digitalization encourages public consumption and increases the public products that have an impact on the economy. Therefore, several strategies need to be implemented like adequate digital infrastructure support, good cooperation between stakeholders to accelerate digital infrastructure, community capacity building to utilize digital technology, and regulation and security to enhance public trust and safety when utilizing digital transactions.

Keywords: Digital Technology, Economic Recovery Strategy, Rural Areas, Village Community

1 Introduction

In this digital era, the increasing internet accessibility is one of the factors that improve the digital utilization in Indonesia. The acceleration of the use of digital technology was getting stronger during the Covid Pandemic where community mobility was limited so that digital technology became a community mobility medium at that time. Oktarina & Nababan [2020] said that Pandemic are decrease the national economy of Indonesia, including village because the mobility restriction makes the tourism and agriculture as the main sectors of village economy were harmed. To face the mobility restriction during Pandemic, most of business sectors in village use the digital technology as the solution in this conditions [1]. One of the largest digital technology utilization forms is the use of digital technology for the economy or digital economy.

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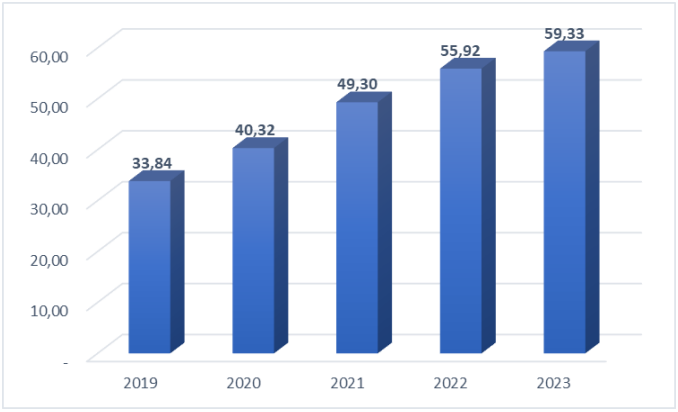
The use of digital technology in economic activities was introduced by [2] Tapscott & Agnew [1999] known as the digital economy. Digital technology utilization in economic activities isn't limited to financial transactions through mobile banking or other electronic money platforms but also seen in trade transactions. The Central Bureau of Statistics (BPS) in Indonesian E-Commerce Statistics states that there are five digital media related to trade transactions, such as instant messaging media, social media, marketplaces, e-mail, and websites. Instant messaging is the most widely used media among these five media [3].

The increasing digital economy in Indonesia is not only in urban but also in rural areas. Post Pandemic Era, the rapid growth of internet networks in villages creates opportunities to accelerate rural economic development through the digital economy [4]. Various businesses in villages affected by the Covid-19 Pandemic such as tourism and micro, small, and medium enterprise (MSMEs), due to the restrictions imposed, have begun to utilize digital technology. After the pandemic, society is getting used to technology to cope with the impacts and risks towards a new normal and develop new product innovations [5].

Other than the pandemic-induced conditions, the development of the digital economy in villages is also supported by the increase in internet network access to the rural areas. The growth of internet networks in rural areas can be seen in Figure 1.



Source: Indonesia Statistic Bureau (2024)

Figure 1. The internet network access in Rural Areas

Figure 1 shows an increase in the percentage of internet use in rural areas from 2019 to 2023. The higher increase of internet use was in 2020 to 2021 when there was a restriction in public mobility about Pandemic. This increase in internet users can be an opportunity in various aspects of village life, especially in encouraging village economic development through the digital economy. The existence of an internet network can enable people to access information including knowledge about technology that can help develop agricultural systems, market price information,

business opportunities, and can also be used to promote local products, such as handicrafts, agricultural products and processed products, thereby increasing people's income.

Digital economy development in villages can be seen through marketing local village products on several existing platforms, including e-commerce. As is known, e-commerce itself is growing rapidly in Indonesia but is dominated by foreign products. This can be controlled by supporting the village marketplace platform [6]. Village e-commerce platform development or marketing of local village products in existing e-commerce is seen as a positive and significant impact on community income and contributes to poverty alleviation supported by adequate infrastructure and human resources [7].

The digital economy focuses on various aspects of the rural community's activities that are affected by digital technology [8], which can stimulate new businesses that support community economic independence and village economic growth [9,10]. Several villages in Indonesia have begun to utilize the internet network to carry out various activities such as using social media in trade transactions as a means of post-pandemic economic recovery. This study aims to capture the role of digital technology, especially in the economic sector, in boosting village economic recovery, especially post- Covid-19 pandemic.

2 Methodology

This paper used a qualitative method with case study and literature review approach. The literature collected from journals and official reports from related institutions. Data from the literature will be confirmed with conditions in several villages in Indonesia. The villages were chosen based on their activities in using technology, especially digital technology in economic activities. The chosen villages are the villages that have become good practices of the smart village program of the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration of Indonesia.

The data from those villages were collected through interviews and focus group discussion (FGD). The villages used in this paper were Panggungharjo Village in Bantul Regency, Yogyakarta Province, Sugihwaras Village in Sidoarjo Regency, East Java Province, and Duda Timur Village in Karangasem Regency, Bali Province. FGDs conducted with village government and Village-Owned Enterprises (VOE).

3 Results and Discussion

3.1 Digital Infrastructure and Digital Literation in Villages

Digital economy is predicted to be a tool in accelerating Indonesia's economic growth and per capita income [11]. This is further supported by Indonesia's digital roadmap 2021-2024 which targets 64 million MSMEs to "Go Digital and Go Global" [12]. The realization of this target is pursued not only by attracting prospective MSMEs but also

by the government through the preparation of digital infrastructure. In addition to preparing digital infrastructure, the role of a sustainable community and collaboration with various parties contribute to digitalization problems and gaps [13].

The existing digital infrastructure conditions in villages such as internet networks are very supportive of developing digital economic platforms. In addition to digital infrastructure, human resources and digital literacy are needed to form a digital ecosystem that can support digital economic development. Panggungharjo Village already has a 4G internet connection because of its location close to the city center. The community there has also utilized the internet for various things such as communication, buying and selling activities, even according to the village government, internet usage tends to increase due to Covid-19.

Information and communication technologies (ICT) infrastructure has a role in improving and strengthening literacy, community activities and the economy through activities and participation carried out online [14]. Similar to Sugihwaras village, which is located close to the city center so that it already has a 4G internet network. Because of Covid-19 the village government tried to develop this potential for economic activities through VOE, coincidentally there were village officials who had information technology (IT) capabilities.

Digital infrastructure also affects digital behavior and internet experience, especially for groups of people who run MSME businesses in villages, while as is known in some villages the internet network is still not good [15]. In Duda Timur Village, although located a little high, has a 4G internet network, there are 2 BTS towers here and many telecommunications operator services are available.

The existence of digital infrastructure provides various benefits in society but in some instances raises concerns regarding the impact of its use and whether it will have an impact on inequality in society [16]. Despite concerns about the impact of existing digital infrastructure in villages, it still needs to be improved to match current needs as not all villages in Indonesia have good digital infrastructure. In a study conducted by Wang on the impact of expanding digital infrastructure on the availability of jobs and increasing income in the village, especially for the non-agricultural sector [17].

In addition to digital infrastructure, community literacy is also needed in utilizing digital technology for economic recovery. It is known that currently the use of the internet by the community is considered still limited to communication, social media, and playing games. However, during the pandemic, it increased for online transaction activities. Digital literacy is used as an effort to respond to rapid technological developments and bridge the digital divide in the global era, various challenges are faced such as content that is relevant to local community conditions, training language, facilities and infrastructure or digital infrastructure and community social conditions [18].

Efforts to improve community digital literacy are carried out through socialization, training and also providing learning infrastructure. In Sugihwaras Village during the

pandemic, they created "Griya Sinau Digital" specifically for children to learn about basic IT, as well as IT training for village officials. Similar to Panggungharjo Village, to develop applications, they collaborate with third parties, including for training. Duda Timur Village also cooperates with third parties and provides training to the community to utilize sm@rt desa.

3.2 Practices of Digital Technology Utilization in Village Support Village Economic Recovery

The development of digital technology is a moment for MSME players to use e-commerce as a marketing medium and has a significant influence on various things such as finance, internal processes, customers, growth and learning as part of innovation [19]. The increasing use of e-commerce during the pandemic has encouraged villages to make innovations with existing digital infrastructure to develop digital-based economies in villages such as marketplaces and e-commerce villages [20]. Some villages in Indonesia have used this step for community economic recovery by utilizing existing digital infrastructure.

Table 1. Utilization of digital technology for economic activities

Village	Platform/application	Use
Sugihwaras	e-BES	As a platform for buying and selling village products and providing shuttle services such as online motorcycle taxis
Panggungharjo	Pasardesa.id	As a platform for buying and selling community products
Duda Timur	sm@rt desa	As a platform for buying and selling community products and for various administrative activities

Source: data processed by authors

Internet and community capabilities can support digital inclusion so technology can be utilized by villages effectively [21]. As is known the main economic driving sector in Bali is tourism, the covid-19 pandemic has made the community to adapt to develop other potential sectors such as agriculture so that digitalization is expected to help in economic recovery of the community [22]. Duda Timur Village, Karangasem Regency, Bali is one of the villages that has digital technology innovations in facilitating public services and digital economic innovations. This digital technology innovation is summarized in a super-app, Sm@rtDesa. This application has brought Duda Timur Village to various awards both at the Provincial and National levels.

The advantages of this system and application are not only for the villagers as individuals, but also for the village economy in general. The Village Government, supported by other community institutions, has used the application to promote Duda Timur Village and its tourist attractions. The utilization of digital technology is a success in promoting an increase in the number of tourists visiting Duda Timur Village.

Panggungharjo Village, Bantul Regency, Yogyakarta is one of the villages in Indonesia that has received numerous awards from the government for its innovations. These

innovations are capable of accelerating village development and contributing to the village economy. Panggungharjo Village's innovation success is determined by three main factors, namely village leadership, village government bureaucracy, and the social environment [23]. One innovation carried out by Panggungharjo Village that often earns appreciation is the digital technology usage in stimulating the economy.

Community conditions, needs and dependence on the internet are seen as an advantage in Panggungharjo Village, which can be transformed into a platform that is expected to facilitate community transactions. The idea then led to a web-based platform called pasardesa.id. Pasardesa.id was managed by VOE in order to serve the village community's trade activities at the early stages of the pandemic, and later expanded as a social assistance distributor. Pasardesa.id sells basic food packages which are social assistance to the community. Pasardesa.id was then developed into an android-based platform with many other VOEs joining in with their various products for sale. The digital-based business model of pasardesa.id has improved the economy of the local people in the villages that use it.

The Sugihwaras Village Government, Sidoarjo Regency drives the community and village economy by collaborating with VOE. Several actions have been taken by the village government and VOE to boost the community's economy, especially during the Covid-19 pandemic. One of them is the Android-based application that serves as a marketplace for VOE, SMEs, and any other products that become the business of village communities. Apart from being a marketplace, this application also provides other bill payment services so that it is very helpful for the community during activity restrictions during the pandemic. This application also arranges delivery services, especially for culinary products. The impact of this application is significant on communities in the village, especially during the pandemic. Consumers can get the products and services they need and merchants can keep running their businesses despite the activity restrictions.

The application was developed by Sugihwaras Village officials who have an interest in IT. Though this application was created as a quick response for the economic downturn during COVID-19 pandemic, the sustainability of this application is important as a platform for expanding the market for village products. However, the lack of socialization related to this platform and the community's limited IT skills have caused it not to run optimally [24]. After the restriction of community activities was lifted, this application was mostly used as an online transportation platform by the village community compared to its trading services.

3.3 Economic Recovery Strategy

Based on the literature review and case study above, this study can conclude that technology utilization has a major role in national economic recovery [25]. The Covid-19 pandemic has forced the transformation of all aspects into digital-based as a strategy to survive in the uncertain economic conditions [26]. Practically, the village's success in utilizing technology is supported by several factors, including the existence of digital infrastructure such as a good internet network, supportive government or village

governance that is positive and open to new things, and human resources in the village. National and local governments play an important role, especially in accelerating and equitable distribution of digital infrastructure. Equally important is the existence of local champions who have a role in initiating and mobilizing the community towards innovations to improve the community's economy [27]. Utilizing digital technology to support economic activities began to be actively implemented during the Covid-19 pandemic to adapt to the restrictions in various ways. The restrictive conditions resulted in all layers of society being affected, but this often led to creativity for economic survival.

Village digital infrastructure plays a significant role in village digital economy. The need for a sustainable, service-oriented and environmentally conscious digital infrastructure can support a digital-based economy [28]. The villages in this study have good internet networks that can support the utilization of technology for economic recovery and community development. Sugihwaras village, which is located around the center of Sidoarjo district, has a good internet network and has 4G. With diverse community needs, it is certain that all of them have used the internet network for various activities such as accessing social media, online classes, trading and other activities. The same situation applies in Panggungharjo and Duda Timur villages.

This is followed by the village government's role in utilizing technology for economic activities in the village. Digitalization itself is the main thing in governance reform to improve effective, efficient public services, control corruption and play a role in improving the community's economy [29]. Some villages have had programs for improving public services even before the Covid-19 pandemic through the use of digital technology such as using websites and applications. At the time of the Covid-19 pandemic, the head of Panggungharjo Village initiated and collaborated with VOE to develop a website-based marketplace called pasardesa.id. This platform is designed to facilitate village communities who are affected by the pandemic and social restrictions to be able to trade easily. Pasardesa.id is also used as a tool for distributing direct cash assistance (BLT) of village funds in a basic-need package model. Moving forward, the pasardesa.id website is being developed into an android-based application and can be used by VOEs from many other villages that join. The development of this digital economy is also supported by the village community, which can be seen from the community's willingness to use pasardesa.id as an alternative trading activity. Another form of support is the social capital that exists in the village community for community business development [30].

The role of government and village governance, as well as local champions in the case of Panggungharjo Village, is very important in supporting the development of the digital economy. There are several obstacles in the development of digitalization such as funding, digital capabilities, limited human resources and infrastructure, therefore a government role is needed in supporting digital transformation by building digital platforms for businesses, online promotion, training and building digital collaboration ecosystems [31]. Duda Timur Village is basically developing the Sm@rtDesa program to improve public services, including supporting MSMEs and tourism. In addition,

Duda Timur Village has also created electronic money that can be used for transactions in the village.

The utilization of digital technology to support the economy in the village is supported by the village government and also in collaboration with third parties. Similar to Sugihwaras Village, which developed digital-based public services, the village government together with VOE also developed the e-BES application as a response to the Covid-19 pandemic. With support from village officials who have expertise in technology, the e-BES application was created by themselves. This application can be used by the community for buying and selling and payment activities. Unfortunately, due to lack of socialization, this application is not used by many people, but the village government has not run out of ideas and developed an online transportation business.

The use of digital technology for village economic recovery during the Covid-19 pandemic generally provides benefits to increase community income, especially in the three villages. Sugihwaras Village recorded that around 65% seller use the e-BES application [32]. In Panggungharjo Village, the circulation of money remain in the village and make it easier for the community to distribute social assistance and improve existing village business such as gold savings from waste management that can be felt by the community during the pandemic [33]. Sm@rtDesa in Duda Timur Villages also increase community income and attract investment from various parties. Quantitatively, the village has not calculated the improvement of the community's economy after economic recovery efforts.

The challenges in utilizing technology for economic recovery in villages need support from various parties. Not only on the condition of digital infrastructure in the village that needs to be accelerated by the government. In the three villages, community support was shown through the use of digital economic platforms, but it was found that there were still many people who could not use it and did not even know about the existence of the platform. Therefore, it is necessary to socialize and increase the capacity of both village officials and the community as users. The findings related to the challenges of utilizing digital technology in village economic recovery are in line with previous studies conducted by [34] Kundius and Pecuh [2019] which explain that infrastructure and information security issues are one of the crucial issues in the implementation of the digital village economy. [35] Sen [2020] also explained the importance of increasing digital literacy and the capacity of village human resources to encourage community participation

4 Conclusion

Villages are adapting to the Covid-19 pandemic by utilizing digital technology for community economic recovery by developing a digital economy in the village. Several important factors in developing a digital economy such as the availability of digital infrastructure in the village that supports digital-based innovations such as the use of websites, making applications and making it easy for the community to access them. Village government support factors and village governance that support both regulations, funding and socialization to the community. Not only that, the government

both at the regional and central levels supports the acceleration of digital infrastructure in places that are not optimal or even affordable. Another factor is the presence of local champions as initiators to develop the digital economy by utilizing available facilities and their role in the community. It is also important that human resources in the village are diverse but supportive for the development of digital economic innovation. Based on these findings, several strategies can be implemented, the first is to provide adequate digital infrastructure support. Second, good cooperation with the government to accelerate digital infrastructure. Third, activities need to be carried out to increase the capacity of the community to utilize digital technology and create regulations and security to increase public confidence in digital transactions.

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