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Digital divide: how is Indonesian public service affected?

Edy Sutrisno*), Mala Sondang Silitonga, Rima Ranintya Yusuf, Alih Aji Nugroho
NIPA School of Administration Jakarta, Jakarta, Indonesia

Article Info

ABSTRACT

This study clearly sets out how much the extent of the digital divide affects e-government services being adopted by Indonesia. Such inequality in access and competence of nations in digital technology is one of the great stumbling blocks erected in the way of the Indonesian government to carry out various programs. The research methodology in this paper is largely qualitative, with a mixed method of case study and literature review of the relevant online media to facilitate a description of the digital divide that translates into the use or nonuse of digital public services. This research seeks to identify trends and relationships that may bind together policy contexts and the digital divide. The data for this research were collected through the analysis of secondary data from a wide range of data sources, including the Indonesia Digital Literacy Index survey 2022 and BPS data, both from the service provider and the service user. The findings of the research point to a very low level of digital literacy in Indonesia, especially in terms of digital security. Mainly, the digital divide complicates the social exclusion of older generations, yet, in principle, digital technologies can help people in the older generation live better lives. The core argument of this report is that cutting the digital divide requires investment, training, and leadership based on trust from the concerned parties to see there is an open fair access to digital services.

Corresponding Author:

Edy Sutrisno,
NIPA School of Administration Jakarta, Jakarta, Indonesia
Email: edysutrisno@stialan.ac.id

Introduction

The development of digital technology has become a catalyst for all sectors to transform from manual work to digital. Previous research has found that digital transformation is changing organizational and work practices (Symon & Pritchard, 2015), knowledge creation (Baralou & Tsoukas, 2015), increased transparency (Hansen & Flyverbom, 2014), and strategic tools to enable development and productivity (Hanna, 2008). In addition, the application of digital technology in the public sector is also useful for managing citizen expectations and creating value in digital services (Arfeen & Saranti, 2021). Digitalization of public services is also a fundamental way for the government to modernize and improve the quality of public services (Arfeen & Saranti, 2021).

Nonetheless, referring to Fasilkom UI, BSSN, and ACCI (2022), there are still many challenges in digital transformation in the public sector in Indonesia.digital divide. One of the obstacles to digitalization in Indonesia is the persistent digital gap or digital divide. Despite government efforts to enhance digital literacy, Indonesia's Digital Literacy Index remains moderate, scoring 3.49 according to the Ministry of Communication and Information Technology (Kominfo) survey. While digital culture has demonstrated the highest proficiency with an index of 3.90, digital safety remains a significant challenge, reflected in its lowest index score of 3.10

(Indonesia Digital Literacy Index Survey, 2022). The digital divide, which is everywhere today, is the gap in access to and familiarity with digital technologies. Conversely, it is essential to realize that the digital divide can make social inequalities worse although some previous research has shown how digitalization could bring about positive externalities. According to Ragnedda (2017), social inequality can be highly magnified by the digital divide. In a bid to shape social justice in contemporary society, Rogers (2016) stresses its significance. Bartikowski et al. (2018) assert that despite its potential for equal opportunities, digital revolution does not have equal opportunities for all thereby leading to social imbalances.

However, through ICT, citizens can have an active role in their economies towards equality development. Moreover, Kerras et al. (2020) argue that effective use of ICTs facilitates educational advancement as well as training and job placement initiatives Hence ICT availability is associated with opportunities available for education and training or employment (Van Dijk 2006; Ragnedda 2017). Others like Hoffman (2000) and Riggins & Dewan (2005) describe these divisions as "haves" and "have-nots" respectively when referring to internet access. The situation changed when internet access became more widely available in developed countries than was thought thus revealing a more complicated dichotomy within what was once called the digital divide at this level where people are also differentiated on the basis of gender ethnicity age location education level among others.By understanding the digital divide affecting factors digital divideand the different forms of the digital divide can take, we can evaluate where further development is needed. Several previous studies highlighted benefits and positive externalities as an impact of digitalization. This condition makes many sectors prescribe digitalization to improve the quality of services, and more and more researchers are studying digitalization. (OECD, 2001).

Several previous studies exacerbates social inequality as a determining factor of the digital divide (Ragnedda, 2017). The digital divide has been labeled a critical issue for social justice in the twenty-first century (Rogers, 2016). It is fair to say that the current digital revolution does not provide equal opportunities for all individuals and, as a result, creates social inequalities (Bartikowski et al., 2018). As its effective use is linked to opportunities in education, training, and employability, ICT can play a significant role in contributing to equality by enabling citizens' powerful involvement and participation in their economy (Kerras et.al ., 2020). The digital divide has multifaceted dimensions, impacts, and implications (Van der Meulen & Van Dijk, 2014); (Al-Hassani & Al-Olayan, 2016). Race, ethnicity, and socioeconomic status are significant factors in the digital divide (DiMaggio & Hargittai, 2001). The impacts include limited access, inequality in service delivery, and digital exclusion. Individuals in underserved areas may have difficulty accessing government online services. The digital divide can lead to disparities in the quality and availability of public services. Those unable to access or use digital services may be excluded from important opportunities and benefits.

Initially, the digital divide was largely equated with access to internet and ICT as called by Van Dijk (2006) and Ragnedda (2017) the "first level digital divide". This was characterized as a binary division of those with or without access by Riggins & Dewan (2005) and Hoffman (2000). The issue of internet access became less clear-cut as more people in developed countries obtained it. It, therefore, became apparent that the matter was not only about having or lacking internet services. Consequently, attention shifted to understanding the "second-level digital divide" which includes other aspects apart from availability such as skills, knowledge and usage. This study therefore seeks to investigate how the adoption of digital based public services is affected by the digital divide in Indonesia. The identification of these factors could help assist us towards amending further development efforts for equal access and opportunities for all in this regard.

Method

This research uses a qualitative approach. The data is carried out by analyzing secondary data derived from online mass media content. Data collection was carried out through literature studies and data from the Indonesia Digital Literacy Index Survey 2022 and BPS to find data related to the digital divide and how Indonesian public service was affected. This research employs a qualitative approach to comprehensively explore the impact of digitalization on public services in Indonesia. A qualitative approach was selected to prioritize an inductive methodology, favoring the use of textual data over quantitative metrics in both data collection and analysis. The qualitative approach addresses research questions or problem statements by gathering primary and secondary evidence. This method yields findings that possess broader applicability beyond the immediate confines of the study. Moreover, the qualitative approach facilitates researchers and readers in interpreting and comprehending complex realities (Mack, et.al, 2005).

This research employs a case study methodology. Creswell (2009) defines a case study as "an in-depth exploration of a program, event, activity, process, or individual(s)", while Sturman (1997) describes it as "a general term for the exploration of an individual, group, or phenomenon". Based on these definitions, a case

study typically involves a problem, a context, and an issue. In this article, the issue under investigation is the impact of digital division on public services in Indonesia. The research draws upon secondary sources. Data were meticulously collected and analyzed to address the research question. The qualitative analysis involves a deep understanding and examination of the data, beginning with an exploration of all data acquisition, verification of data validity, and subsequent interpretation. The data collection technique employed in this article was internet-based research. The researcher utilized the Publish or Perish software by entering relevant keywords 'digital divide'; 'digital literacy'; public services', including online mass media content, literature reviews, data from the 2022 Indonesia Digital Literacy Index Survey, and BPS statistics.

Results and Discussions

Internet Adoption and Usage Patterns In Indonesia
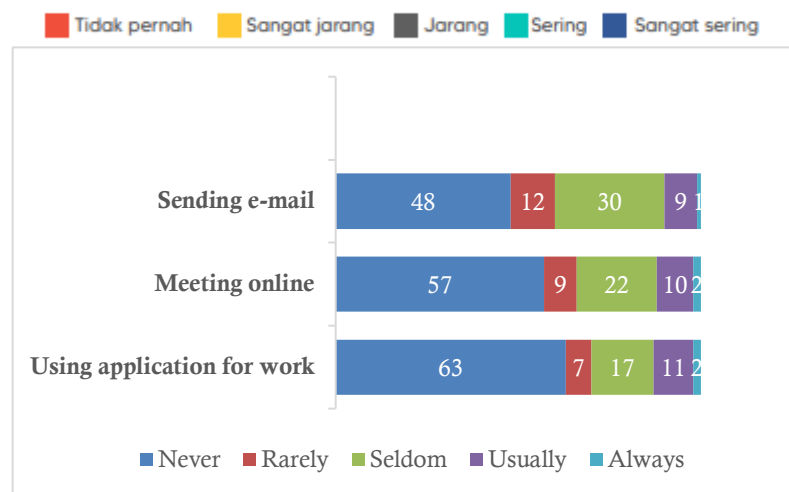
Figure 1. Indonesian Digital Literacy by Occupation
Source: Indonesia Digital Literacy Index Survey (2022)

Results of a 2022 survey carried out by Kominfo on the Status of Indonesia Digital Literacy show that the majority of the country's workforce is alien to the use of computers and laptops. Yet, of the participants, only a very modest 26.67% indicated that they use either for work—73.33%, likewise, indicating no such use.
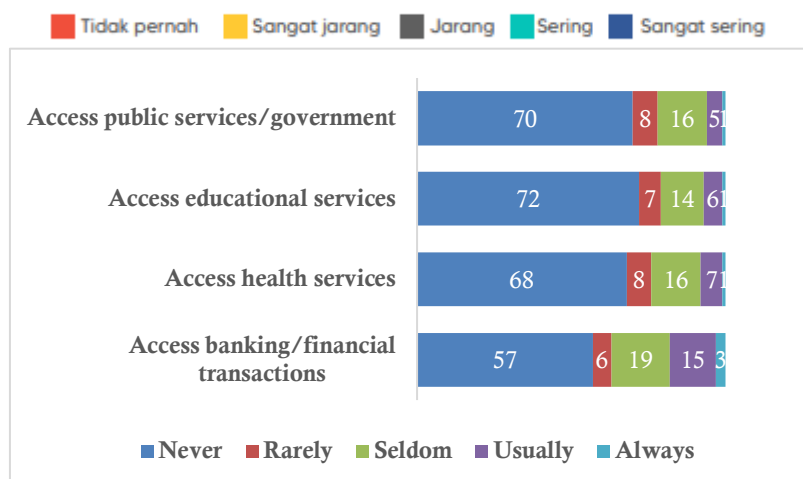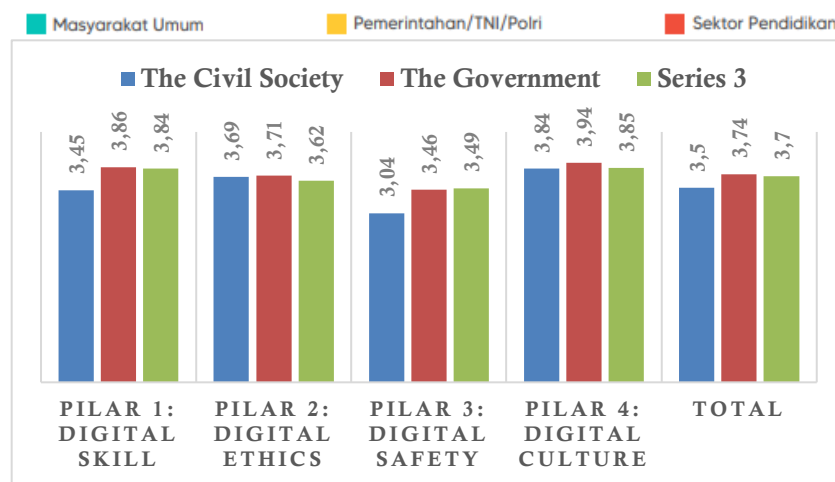

Figure 2. Indonesia Digital Literacy based on Service Access
Source: Indonesia Digital Literacy Index Survey (2022)

An appreciable fraction of people have never used the internet to access services, according to data compiled from the Kominfo Survey on the Status of Digital Literacy in Indonesia in 2022. The same survey revealed that a considerate percentage—57%—of the respondents had never accessed banking or financial services over the

internet. Furthermore, 68% of the subjects had never used health services online, 72% had never used education services online, and 70% had never used public or government services online. Owing to inequalities in access to electronic equipment, for instance, computers, smartphones, and the internet, everyone is not accorded equal opportunity in this regard. This inequality is brought about by by various factors, including geographic considerations (underserved, remote, and frontier regions), economic constraints (high costs of technological devices), and infrastructure deficiencies (inadequate electricity and network connectivity in certain areas). Beyond accessibility, it is evident that skills also play a pivotal role in digital literacy. Even when individuals possess technological devices, a lack of proficiency in utilizing these tools effectively can hinder their optimal application.

Figure 3. Digital Literation Index Based on Segmentation of Society
Source: Indonesia Digital Literacy Index Survey (2022)

The survey results above indicates that one of the pillars of low digital literacy in Indonesia is the digital safety pillar. The data shows that people's understanding and ability towards digital security is still lowIndonesia has a relatively low level of 62% for its digital literacy compared to the regional average of 70% in ASEAN (Anam, 2023). The literature indicates that personal factors such as age, education, and gender influence the adoption of digital literacy. This statistic cannot be overlooked by the government, as it can potentially contribute to societal challenges. The first challenge is the economic divide, wherein individuals without digital access or skills tend to face more limited employment prospects and struggle to participate effectively in the digital economy. In this era of digital transformation, a workforce equipped with information technology skills is undoubtedly essential. Second, the social divide arises as the digital divide can lead to social isolation and reduced participation in community life. Third, the educational divide emerges as limited access to technology can hinder the learning process and diminish opportunities for quality education.

However, it's important to note that while abundant access to technology can be beneficial for society, it can also be detrimental due to the presence of negative information on the internet, such as hoaxes, fraud, and crime. Recognizing the significance of digital literacy, ASEAN declared in 2020, in its Human Resource Development for a Changing World of Work and its Roadmap, that digital literacy is a crucial tool for fostering lifelong learning and enhancing workforce competitiveness (Agbisit, 2024). Consequently, the ASEAN Digital Literacy Program (ASEAN DLP) was established to implement digital literacy training across ASEAN countries, aiming to fight misinformation and disinformation (Kominfo, 2024).

Generational Divide and Social Exclusion
The digital divide has become an important and evolving topic as the digital economy has grown. It first gained international attention and prominence when it appeared in several United Nations (UN) reports, and it has since become a critical concern for organizations, policymakers, and scholars in a variety of fields (Dijk, 2020). The term "digital divide" refers to the disparity between individuals, households, businesses, and geographic areas at various socioeconomic levels in terms of access to information and communication technologies (ICTs) and the use of the internet for a wide range of activities. The digital divide is the difference between those who have adequate access to information and communication technology (ICT) and those who have limited or no access to ICT (Soomro et al., 2020). In graphic below, Indonesian Digital literacy index show us still low, especially in Digital Safety.

Figure 4. Indonesian Digital Literacy Index
Sumber: Indonesia Digital Literacy Index Survey (2022)

Two additional levels of the digital divide have been identified by Van Deursen & Van Dijk (2014); Ragnedda (2017); Scheerder dkk. (2017); Van Deursen & Mossberger (2018);Lutz (2019). Many scholars argued that the concept should be interpreted in light of multiple factors, rather than just the distinction between "have and have-not." (Leavitt, 2002). The shift in focus to differences in digital skills and usage was dubbed the "second-level digital divide." (Riggins & Dewan, 2005; Hargittai, 2002; (Van Dijk, 2006). On one hand, it has been noted that even with equal levels of access, people have not the same skills and knowledge to use digital resources in the same way, leading to the different usage levels, which has been understood as the second level of the digital divide (Van Dijk, 2006). The number of studies on this topic has steadily increased, which can be explained by the constant technological developments which generate new issues of access and coverage (Gilbert, 2010; Chen et al., 2014). The 'third-level digital divide' refers to the shift from a focus on skills and Internet use to a focus on the positive outcomes of Internet use (Wei et al., 2011). This third level of the divide occurs when digital skills and Internet use do not result in positive outcomes for all individuals (Van Deursen dkk., 2016). Nevertheless, there has been an emergent necessity to analyze the digital divide beyond the issue of access especially in developed countries where the problem has been minimized.

Based on this, several countries around the world still experience a digital divide, such as In South Korea, there is a digital divide that hinders the innovative potential of internet technology in environmental governance. This digital divide primarily occurs at the supply side, shaped by the characteristics of local government organizations and the wealth of community organizations. Organizational factors such as innovative leadership and the availability of resources also play a significant role. The low quality of city websites is often due to budget constraints and the limited technical expertise possessed by local governments. To address this issue, the central government should develop programs that provide financial subsidies and technological assistance, enabling city governments to adopt innovations in local governance (Lim, 2010). In India, a significant portion of citizens cannot access or use government electronic applications and services. This exacerbates the digital divide between rural and urban communities and economically disadvantaged groups.

To bridge this widening digital divide, India has introduced the Common Service Centers (CSC) as a means to provide electronic public services to residents at the village level. However, there are still several issues in its implementation, such as connectivity problems, delays or lack of government-to-citizen (G2C) services, loss of motivation among village-level entrepreneurs due to the lack of G2C services, low computer literacy, lack of awareness about the services and facilities, inadequate training and support, poor infrastructure provision, lack of support from relevant government officials, inaccessible locations, high investment burdens, government-level corruption, shortage of skilled personnel to run the CSCs, unreliable electricity supply, language barriers, insufficient space, maintenance and network connectivity management issues, and challenges posed by Naxalite and anarchist activities. Therefore, both the public and private sectors, as well as policymakers, need to ensure effective implementation and long-term sustainability of the CSCs (Dwivedi et al., 2016).

In the United States, the increasing number of citizens utilizing mobile capabilities has led the government to provide services involving community participation. M-Government is more accessible to the public compared to traditional e-government platforms that require connectivity. Many U.S. citizens still lack adequate access to Internet connectivity, and their reliance on wireless networks further limits their interactive capabilities. The digital divide remains a problem as advanced e-Government initiatives progress rapidly, leaving some citizens behind. While the government may be addressing the digital divide by expanding mobile capacity based on ethnicity, race, and education, it has yet to tackle crucial aspects of the urban digital divide in poorer areas. Efforts to bridge this digital divide must involve not only the integration of innovative technology but also the

transformation of existing services into platforms that allow users, regardless of their devices, to access services equitably (Mossey et al., 2019). Many local governments in the United States have noted that minority groups are more likely to request services through the 311 system for essential service recovery during disaster recovery. E-governance platforms supported by Web 2.0 and mobile technology have provided alternative co-production channels for historically disadvantaged groups who lack economic or political capital to participate in traditional co-production. As e-governance technology becomes more prevalent, it can serve as "digital capital" for minority groups to address disparities in public service provision. To facilitate the utilization of this digital capital, local governments may need to conduct marketing campaigns and community outreach to increase public awareness and acceptance of e-governance technology (Xu & Tang, 2020).

In the UK, although digitalization offers many opportunities for rural areas, they still lag behind urban areas in terms of access to and implementation of internet-based services. This gap is the result of various market failures in both the demand and supply of broadband access, which have been addressed through government, private, and community initiatives. Despite efforts to expand superfast broadband coverage across regions, public-private partnerships have not fully resolved the access gap in the most difficult-to-reach areas. Some of these areas are served by community networks, which rely on volunteers and demand aggregation to reduce the costs of fiber rollout. However, the scalability of this approach remains unproven. On the demand side, both initiatives have achieved high uptake levels, demonstrating that the 'adoption' gap in rural areas has decreased over the years. Nonetheless, much more needs to be done to ensure that rural communities and businesses can fully benefit from superfast broadband (Gerli & Whalley, 2021).

In several countries around the world, the digital divide remains a significant issue. In South Korea, the digital divide hampers the innovative potential of internet technology in environmental governance due to local government budget constraints and limited technical expertise. In India, the digital divide between rural and urban areas is exacerbated by limited access to government electronic services, despite initiatives like Common Service Centers (CSC) to provide electronic public services. In the United States, while mobile government (M-Government) is more accessible, many citizens still lack adequate internet connectivity, leading to ongoing digital inequality. In the UK, rural areas lag behind urban regions in broadband access and implementation despite public-private partnerships and community networks, with the scalability of these solutions yet to be proven. Finally, there are still significant efforts needed globally to ensure that all communities can fully benefit from digital advancements and superfast broadband (Gerli & Whalley, 2021; Lim, 2010; Mossey et al., 2019; Dwivedi et al., 2016; Xu & Tang, 2020).

The development of digital technology provides opportunities for the older generation to improve the quality of living. Technological developments provide opportunities for the older generation to check their health regularly with the doctor digitally, book their health checkup schedules through digital devices, and access health content through digital media. Especially now that most services have switched from manual to digital platforms, such as banking, groceries, food orders, transportation, and others. But some research found that the older generation accesses less technology in their daily lives (Seifert, 2020). Choi dkk. (2020) also found that ageing has a strong association with decline in use of internet.

Digital divide has exacerbated social exclusion, especially in the older generation (Seifert, 2020). Several previous studies have shown that there is a correlation between age and digital proficiency and also the level of penetration of access to technology (Steyaert & Gould, 2009). This condition can cause the older generations who are not online or not active in using digital media are at risk of social exclusion (Seifert, 2020). In addition to impacting on well-being, mental health, and relationships, this social exclusion has the potential to be a barrier to the principle of justice, as well as to realize fair digital based public service. Minimizing the older generation digital divide is linked to improvement in the health and welfare for the older generations (Mubarak & Suomi, 2022). The role of peer support is vital in helping the older generation to embrace digital technology and benefit from it.

Critical Keys to Lessen Digital Divide
This research pointed out the importance of considering critical keys to reduce digital divide. There are some issues to be considered to reduce the digital divide. These are investment, training, leadership and fostering trust among stakeholders. Investment involves determining the amount of money. Leadership involves the leaders in all tiers of government having commitment to jumpstart their government operation into digital. Training involves investing resources to ensure that people know how to use tools so they can take part in digital transformation. Training of government workers to be capable of using digital tools and applications, and training of citizens to enable them to adequately use digital tools and applications and have a good digital literacy. Another thing to increase digital adoption is to foster trust and confidence among stakeholders.

Digital literacy is crucial in the era of information technology. Numerous technological innovations, when utilized optimally, can significantly benefit society. However, Indonesia's digital literacy rate stands at only 62%, ranking among the lowest in ASEAN. This gap demands urgent attention from the government. Addressing this digital literacy gap necessitates an integrated and holistic approach. Indonesia has adopted two strategies to bridge this divide: top-down and bottom-up. The top-down strategy is initiated and implemented by the government, specifically, the Ministry of Communication and Information Technology (Kominfo), acting as an accelerator, facilitator, and regulator to narrow the digital divide across regions.

The mega-project to bridge the digital divide is the Palapa Ring, a telecommunications infrastructure project involving the development of an optical fiber network spanning 36,000 kilometers across Indonesia. This project comprises seven smaller optical fiber rings (for Sumatra, Java, Kalimantan, Nusa Tenggara, Papua, Sulawesi, and Maluku) and a backhaul network connecting them all. The Palapa Ring integrates the existing network with a new network in eastern Indonesia, known as the Palapa Ring-East. The Palapa Ring-East will be constructed over 4,450 kilometers, including 3,850 kilometers of submarine cable and 600 kilometers of land cable, with fifteen landing points in 21 districts/cities. This network boasts a capacity of 100 GB, employing a ring and two pairs concept. It serves as the foundation for all telecommunications providers and users of telecommunications services in Indonesia. The Palapa Ring project is the government's endeavor to accelerate the growth and equitable distribution of socio-economic development through high-quality, secure, and affordable telecommunications infrastructure.

Concurrently, non-physical aspects such as skills require enhancement. With a relatively widespread and accessible infrastructure and technological devices readily available, it is imperative to improve digital skills, particularly digital literacy. Moreover, the advent of information technology has led to the displacement of millions of jobs and the creation of millions of new ones (Jayanthi & Dinaseviani, 2022). If the disparity in digital technology knowledge persists, Indonesia will likely face significant unemployment. To address this issue, the "Indonesia Makin Cakap Digital" initiative was launched in 2021, encompassing several agendas to bridge the digital divide, including various training programs and initiatives within the context of digital HR Development (Kominfo, 2020). These agendas are as follows:

The National Digital Literacy Movement (GNLD) is implemented and categorized into various classes. It focuses on four primary pillars of digital literacy: digital ethics, encompassing ethics related to digital technology; digital safety, concerning data and access security; digital skills, pertaining to skills and knowledge; and digital culture, promoting good habits and positive influences to foster a new digital culture. Intermediated digital skills are addressed through the Digital Talent Scholarship (DTS), targeting new graduates, technician-level workers, and professionals. This scholarship program aims to enhance skills and competitiveness in the field of information technology. Advanced digital skills are targeted at policymakers through the Digital Leadership Academy. The DLA's outcomes include the development of customized policies and modifications to project designs by participants. The Digital Technopreneur program is specifically designed for MSMEs to encourage digital start-ups to upgrade. This program builds upon the existing UMKM Go Digital program.

Conclusions

The research provides critical findings on the nature and implications of the digital divide in Indonesia for service delivery. Herein is a presentation of the findings and recommendations: (1) Digital Literacy Gap: At a rate of only 62%, neither does Indonesia score well nor hold a good digital literacy rate amongst the populace of the ASEAN countries. The largest digital gap for the country prevails in digital safety skills, with the score being 3.10 out of 5. (2) Generational and Social Exclusion: The digital divide aggravates social exclusion, especially for the older generations. This, in turn, affects the potential of the older generation to use digital public services and their full involvement in the digital economy. (3) Multidimensionality of the Digital Divide: It has to be underlined that the research highlights not a 'simple access' dimension but also the existence of a gap in skills, patterns of use, and the capability of benefiting from digital services. (4) Addressing the digital divide in the country, the Indonesian government has already taken top-to-bottom and bottom-to-top models. In view of this, the current initiatives can include the Palapa Ring project for infrastructures development and the "Indonesia Makin Cakap Digital" program for skills development. (5) Critical Factors for Bridging the Divide: The research identifies four salient elements through which the digital divide can be bridged, investment in the infrastructure and technology, comprehensive training programs, strong leadership commitment, and the building of trust among the stakeholders. (6) Public Service Implications: The digital divide significantly influences the level of adoption and effectiveness associated with digital-based public services, with a provoking potential of leading toward meticulous inequalities in service delivery and citizen participation. (7) Global Context: The research also puts Indonesia's challenges in perspective with global comparative arguments about digital divide issues in countries such as South Korea, India, the United States, and the United Kingdom. (8) Also clear from the study

is that bridging the digital divide is not something that creates linear development. It needs an alignment of the development of infrastructure, physical and concrete, with skill development and policy intervention, all at one go.

In conclusion, this research towards the end highlights the grave need for collective efforts aimed at the reduction of Indonesia's digital divide. It has shown that the reduction of this divide is imperative not only in the development of enhanced public service delivery but also in social inclusion and economic development. The following findings that emerged imply that this needs to begin with a comprehensive strategy touching on the technological and human sides of the digital divide by policymakers and organizations. This means more investment in digital infrastructure, better digital literacy programs for policies that allow fair access to digital services for all sections of society. Addressing these challenges will build a more inclusive digital ecosystem for Indonesia, benefiting all citizens, leading ultimately to more effective e-governance, and better public service delivery. These insights from the study are valuable for further areas of research and policy formulation on digital governance and social inclusion in low-developing countries.

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