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THE PREPAREDNESS OF VILLAGE GOVERNMENTS FOR THE DIGITAL TRANSFORMATION OF PUBLIC SERVICES IN BANYUMAS REGENCY, INDONESIA

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Abstract. *The objective of this study is to assess the level of preparedness exhibited by village governments in relation to the digital transformation of public services. The advancement of Information and Communication Technology (ICT) has brought about significant transformations in both the private and public sectors. Particularly, it has played a pivotal role in driving the modernization of public services at the regional level, with a specific focus on village governance. In Indonesia and other developing nations, the process of transformation faces various challenges. These challenges encompass: a digital divide resulting from an inadequate ICT infrastructure network, limited innovation leadership, and a lack of digital literacy within the local government apparatus. This study employs a descriptive quantitative approach to further investigate the aforementioned issues. The research involved 75 village governments in Banyumas Regency, and the collected data were analyzed using descriptive statistical methods. The findings indicated that the insufficient focus and dedication of regional and village governments towards the advancement of ICT in their respective areas, along with the limited investment in enhancing the digital proficiency of government personnel, are influential factors in determining the level of preparedness of village governments for the process of digital transformation.*

Keywords: *digital transformation; level of preparedness; public services; village government.*

Reikšminiai žodžiai: *skaitmeninė transformacija; pasirengimo lygis; viešosios paslaugos; kaimo vadovybė.*

Introduction

The advent of the digital revolution has resulted in a diverse range of innovations in both the industrial and public sectors, thereby influencing the provision of services and fostering innovation (Okkinakos et al. 2016; Sjödin et al. 2018). Public sectors actively pursue competitive advantage by leveraging innovative digital services (Martín-Peña et al. 2018). To effectively respond to the dynamic environment, the incorporation of e-government concepts has been undertaken. Mergel, Edelmann, and Haug (2019) assert that the adoption of e-government on the Internet as a service model has significantly bolstered the efficacy of public services. The adoption and utilization of this particular technology has been found to have a positive impact on the overall standard of public services, as well as on the efficiency of administrative processes. Additionally, it has been observed that it contributes to the advancement of democratic principles, fostering transparency and inclusivity (Bannister and Connolly 2014).

The implementation of e-government has been found to enhance public trust and satisfaction in local governments, enabling citizens to access services in a flexible manner irrespective of temporal and spatial constraints (Bernhard et al. 2018). The implementation and development of robust ICT infrastructure has been shown to significantly contribute to the promotion of transparency and accountability in various aspects of public services, as well as administrative and political processes (Whitacre and Mills 2010; Townsend et al. 2013). As a result, the utilization of information and communication technology (ICT) in e-government initiatives promotes the facilitation of citizen engagement in a convenient manner.

The universal adoption of rapid and massive changes in the service delivery system may be hindered by factors such as inadequate ICT infrastructure and low digital literacy within communities, thereby limiting the convenience that digital transformation can provide (Joshi and Islam 2018). The geographical conditions present in Indonesia also pose significant obstacles in the pursuit of digital equality. According to the data provided by the Indonesian Central Bureau of Statistics (2022), Internet access was available to a mere 58.3% (158 million) of the overall population in 2021. Furthermore, the aforementioned report indicates that only 55.75% of villages and hamlets (46,485 out of 83,381) had access to the Internet. These figures underscore the evident disparities in the distribution of network infrastructure, with rural areas being disproportionately affected (Kementrian Pendayagunaan Aparatur Negara dan Refromasi Birokrasi 2022). In addition, village governments encounter challenges in fulfilling technological requirements, such as the necessity for proficient personnel and favorable regulatory frameworks (Salemink et al. 2017).

The process of digitizing villages in Banyumas Regency entails various challenges and opportunities that have a substantial impact on the results of digital transformation, with a specific focus on the 71 villages located within the region. Irwansyah and Haninda (2019), as well as Yamin et al. (2018), delineated a number of obstacles that necessitate resolution, encompassing: deficient ICT infrastructure, restricted proficiency in digital literacy, financial constraints, and aversion to change. However, the potential benefits are significant, and include: improved service delivery, economic growth, the empowerment of local communities, education and skills development, and enhanced transparency and accountability in governance (Puspasari 2018; Rokhman 2020). By leveraging these opportunities and taking proactive measures to overcome challenges, local governments have the ability to develop efficient strategies that can bridge the digital divide, foster digital literacy, and empower communities to fully harness the transformative power of digital technology in village governments within Banyumas Regency.

Furthermore, the allocation of village funds in Banyumas Regency assumes a significant role in facilitating the development of local capabilities by leveraging ICT. According to Rokhman (2020), the provision of funds specifically earmarked for the development of villages enables village authorities to allocate resources towards: the establishment of ICT infrastructure, the implementation of training initiatives aimed at enhancing digital literacy, and the execution of projects centered around technology. By utilizing the village fund, communities have the ability to procure essential hardware and software resources, as well as establish community centers equipped with Internet connectivity.

The objective of this study is to provide an overview of the level of preparedness exhibited by the local government in Indonesia with regard to implementing digital transformation initiatives in the realm of public services. The subject matter at hand aligns with the pronouncement made by the President of Indonesia during the 2020 G20 summit in Bali, wherein digital information was identified as one of the foremost concerns in the country's progress. As previously stated, Indonesia and several Asia-Pacific nations face significant challenges in their efforts to promote digitalization within their respective territories. The literature review section of this paper provides an in-depth analysis of the concept of digital transformation, elucidates the core components of digitalization, and examines the challenges encountered during the process of digital transformation. The subsequent section elucidates the various approaches and methodologies employed in the research conducted, followed by the presentation of findings and empirical analysis. The final section encompasses the discussion, conclusion, and contribution of the current study.

Literature Review

Digital Transformation in Public Services

The process of digital transformation is influenced by three external factors. The proliferation of the Internet has played a significant role in driving advancements in various associated technologies. These include: broadband, smartphones, Web 2.0, search engine

optimization (SEO) tools, cloud technology, voice recognition, online payment systems, and digital currencies. Consequently, these technological developments have greatly contributed to the expansion of e-commerce (Verhoef et al. 2021). Furthermore, the advent of novel digital technology has caused significant disruptions in the competitive environment, resulting in heightened levels of competition among retail enterprises and facilitating the ascendancy of market-dominating enterprises led by younger generations (Verhoef et al. 2021). Furthermore, the advent of the digital revolution has prompted alterations in consumer behavior, resulting in a notable transition towards the practice of online shopping. The significance of digital touchpoints in the consumer journey has been heightened by this transition, impacting sales in both online and offline channels (Kannan and Li 2017).

According to Mergel, Edelmann, and Haug (2019), digital transformation is composed of three essential components. Firstly, this entails the utilization of technology to modify the approach of delivering services, thereby enabling direct engagement between service providers and customers. In the realm of private enterprise, this phenomenon gives rise to novel advancements, exemplified by the emergence of online ride-hailing services facilitated by platforms such as Go-Car, Go-Jek, and Grab. Within the realm of the public sector, there is a notable shift towards the adoption of e-government principles, which involve the transfer of services from traditional offline channels to online platforms. The main purpose of this transition is to improve the efficacy and efficiency of governance (Meijer and Bekkers 2015; Cordella and Tempini 2015; Linders, Liao, and Wang 2018; Siddiquee 2016).

Moreover, digital transformation encompasses the application of technology to alter the cultural and communicative structures within an institution, thereby initiating a paradigm shift that augments the delivery of services, transparency, accountability, and civic engagement in the governmental sphere (Reyes and Gil-Garcia 2014; Nograsek and Vintar 2014). Sivarajah, Irani, and Weerakkody (2015) argued that the incorporation of digital tools plays a crucial role in enabling transformations in work methodologies, communication practices, and service delivery. These tools facilitate the active engagement of citizens and stakeholders in the cooperative design and implementation of public services. Moreover, the digital transformation process enables the creation of improved linkages between service providers and users, resulting in the emergence of innovative value propositions in both the private and public sectors. Collaboration, co-design, co-creation, and other associated endeavors have emerged as indispensable elements of contemporary culture, particularly within the public sector. The implementation of ICT has resulted in notable transformations in fundamental principles and has facilitated the engaged involvement of individuals and interested parties in the process of generating value (Berman 2012, 6; Bannister and Connolly 2014).

The process of digital transformation is typically influenced by technological advancements, alterations in consumer behavior, and shifts in organizational culture. The combination of these factors leads to significant alterations in service delivery and value creation across various industries.

The digital divide poses a significant barrier to the process of digital transformation

The notion of the digital divide refers to the unequal distribution and usage of ICT among different socio-economic strata, including individuals, households, businesses, and geographical areas. This concerns the availability of ICT in a community, facilitated by an online network (DiMaggio et al. 2001, 310; Sparks 2013, 28). The availability of technology within a community is shaped by a range of socio-economic factors, such as: economic resources, educational attainment, proficiency in ICT, attitudes towards technology, financial well-being, social connections, and age (Blank and Groselj 2015, 276).

The digital divide can be characterized by four dimensions: digital skills and literacy, user autonomy in Internet access, social support for Internet use, and integration into the prevailing techno-culture. Furthermore, the digital divide is perpetuated by the inequitable allocation of technological infrastructure. According to Philip et al. (2017), the provision of Internet services is contingent upon the presence of telecommunication infrastructure, which can be facilitated either by governmental entities or private enterprises. Nevertheless, it is commonly observed that rural communities exhibit a lower level of receptiveness towards the advancement of information technology, thereby impeding endeavors aimed at enhancing digital connectivity (Malecki 2003; Velaga et al. 2012).

The issue of inadequate connectivity in rural areas is a significant concern, which is influenced by various factors including the potential market for digital technology, investment in technology infrastructure within villages, government focus on regional development, and the presence of supportive policies and regulations (Salemink, Strijker, and Bosworth 2017). The development of digital connections in rural areas is significantly influenced by adaptive local leadership (Malecki 2003).

Research Method

The present study employed a descriptive quantitative approach to depict phenomena, events, symptoms, or incidents in a factual, systematic, and accurate manner, relying on the existing quantitative data. The utilization of this methodology facilitated the collection of factual evidence, data, and pertinent information pertaining to the level of preparedness exhibited by village governments. These findings were subsequently presented in a variety of numerical formats within the research sample. In order to acquire the anticipated data, the researchers adhered to the normative framework of reference in order to systematically observe and collect data utilizing appropriate research instruments. The data were collected and examined for the purpose of providing descriptive information, using a significant sample of participants (Babbie 2007, 450; Creswell 2008, 145).

Samples were acquired using a multistage cluster random sampling method, which considered the geographical features and typology of the villages in the Banyumas Regency. The process of selecting research samples, in the form of villages, was determined by employing the Slovin formula. A representative sample of 75 villages was selected from a larger population of 301 villages, with a margin of error of 10% and a confidence

level of 95%. To ensure compliance with the principle of representativeness, the sampling procedure employed a multistage random sampling technique. The first step in this study entailed the identification of a cluster by categorizing 27 subdistricts within Banyumas Regency into 7 distinct regions. This classification was based on the proximity of these subdistricts to the central government office located in Purwokerto. The identified regions were named as follows: South Banyumas, Southwest Banyumas, West Banyumas, Central Banyumas, North Banyumas, Suburban, and City. The data that was collected was analyzed using descriptive statistical methods, specifically through the use of frequency distribution.

Result and Discussion

The successful implementation of digitalization in local government public services necessitates adequate preparation and readiness, with a particular focus on proficiency in both ICT management and utilization (Deloitte Research 2000). The quality and availability of ICT infrastructure, as well as the ability of users, business players, and government to effectively utilize ICT for maximum benefit, can be measured by the level of preparedness (Economist Intelligence Unit 2008). This study aims to delineate the four aspects that encompass preparedness for digital transformation: (i) *Supporting Policies for Digital Transformation in Public Services* (ii) the role of leadership in village government, (iii) the competency of village apparatus, and (iv) the accessibility and connectivity of the village government regarding Internet connection.

Supporting Policies for Digital Transformation in Public Services

According to Hudson, Hunter, and Peckham (2019), the implementation of public interest programs necessitates the establishment of accompanying policies to guarantee their compliance with legal frameworks. The supporting policies for the implementation of e-services pertain to regulations that establish the normative framework for the execution of public services at the village level. The policies in question encompass a broad spectrum, from overarching policies established by the Central Government to policies formulated by local village governments. At the macroscopic level, digital policies in rural regions are formulated according to the guidelines provided by the Ministry of Villages and the Development of Disadvantaged Villages. These guidelines encompass four distinct models of digitalization, which prioritize: the establishment of databases, the development of noteworthy villages, the acceleration of village government services, and the enhancement of transparency regarding financial status and development (Village Digital Profile 2021).

In 2021, the implementation of the Village Information System (SID) sought to facilitate the consolidation of administrative services within the villages of Banyumas Regency. At the time of its launch, a mere 3% of villages had successfully transitioned to digital platforms for the provision of public services. By 2022, the number of villages effectively utilizing ICT in most public services in Banyumas Regency had increased to

seven, representing less than 3% of the total villages undergoing digital transformation.

The Role Leadership in Village Government

The role of leadership is of paramount importance in the attainment of transformation (Hammer and Champy 1993). The successful implementation of digital transformation in public services is contingent upon the presence of proficient leadership within organizational structures. The study's results indicate that the village heads in Banyumas Regency demonstrated a considerable degree of leadership, as supported by an aggregate leadership index score of 82.5. Nevertheless, it is crucial to acknowledge that specific dimensions and categories might not comprehensively encompass the complete spectrum of village heads who possess the requisite skills and competencies to facilitate digital transformation. Based on the information provided in Table 1, it can be observed that only 61.3% of village heads were able to effectively establish the public service system, attaining a score of 75% on the index. Moreover, a meager 53% of village leaders demonstrated the capability to successfully inspire their personnel to adopt innovative methodologies.

Table 1. *The statements of the heads of villages regarding their leadership in supporting digital transformation*

No	Indicator	Category (%)				Index %
		5	4	3	2	
1	Commitment of the head of the village to address issues related to village public service.	34.7	65.3	0	0	87
2	Dedication of the head of the village to developing village public services.	18.7	80.0	1.3	0	84
3	Motivation of the head of village to develop digital-based public services/e-services.	8.0	61.3	30.7	0	75
4	Encouragement from the head of village to the village apparatus to exercise innovation when performing their work.	30.7	53.3	14.7	1.3%	82
5	Support of the head of village in developing ICT and Internet infrastructure.	36.0	45.3	18.7	0	83
6	Support of the head of village in the form of budgeting for the development of digital-based public services/e-services.	30.7	46.7	22.7	0	81
7	Knowledge of the head of village about ICT in public services.	30.7	58.7	10.7	0	84
8	Capacity of the head of village to drive the village apparatus to support the e-service program.	29.3	61.3	9.3	0	84
	Mean value	27.4	59.0	13.5	1.3	82.5

Source: *processed primary data*

The implementation of innovation in rural communities is heavily influenced by the leadership styles of village heads, who serve as key community leaders (Martiskainen 2017). Accordingly, the concept of leadership encompasses the evaluation of external demands and prospects, the establishment of objectives, the exertion of influence and guidance on others to achieve shared objectives, the stimulation of action, and the promotion of responsibility for performance. Effective leadership involves a crucial aspect of demonstrating dedication towards the endorsement and implementation of sophisticated service systems, particularly the e-service model. Nevertheless, scholarly research suggests that not all leaders possess the ability to facilitate transformative change (Lestari and Nasib 2020).

The Competency of Village Apparatus

The significance of human resources in organizations has been widely acknowledged (Lusthaus et al. 2002, 52). In order to facilitate the digital transformation of public services in rural areas, it is imperative to have a proficient workforce capable of effectively utilizing digital tools, specifically computer systems, to deliver services to the local community. The findings of this study indicate that a mere 28.4% of the village apparatus in 75 villages exhibited proficiency in fundamental computer skills, while the remaining 71.6% were found to be deficient in training in this domain. Furthermore, 38.7% of individuals demonstrated proficiency in operating computer systems, while the remaining 61.3% exhibited an inability to do so.

There was a correlation observed between the level of computer literacy among village apparatus and their educational attainment. Specifically, 69.6% of the village apparatus had completed high school, 11.22% had completed middle school, 17.86% had completed undergraduate programs, and 1.61% had completed primary school. The limited level of computer literacy presents challenges for village governments in effectively keeping up with advancements in ICT. Table 2 presents data on the operational capacity of computer sets within the village government apparatus.

Table 2. *The competency of village government apparatus in operating computer sets*

No	Competency indicator	Category			
		Advanced	Intermediate	Beginner	Incapable
1	Operating and mastering MS Word.	20	58	17	5
2	Mastering Excel.	10	17	33	40
3	Competency to create and deliver a presentation using a computer.	5	30	20	45
4	Competency to use the Internet.	36	38.7	20.3	5
5	Competency to use multimedia.	27	52.5	15.5	5
6	Competency to use YouTube.	60	21.3	18.7	0
	Mean value	26.3	36.3	17.8	16.7

Source: *processed primary data*

According to the data presented in Table 2, a notable proportion of individuals in the village demonstrated proficiency in computer usage. Specifically, 26.3% were classified as experts or skillful users, 36.3% were categorized as intermediate users, and 34.5% were deemed incapable or less capable of operating computers.

The Accessibility and Connectivity of the Village Government regarding Internet Connection

The successful implementation of digital transformation necessitates the availability of a reliable Internet connection and the establishment of a well-developed infrastructure network. Nevertheless, rural areas encounter difficulties as a result of the inequitable allocation of infrastructure networks, thereby impeding the ability of rural communities to access the Internet (Sparks 2013, 28). The presence of numerous hilly and mountainous areas in Banyumas Regency exacerbates the typological features of its villages, thereby influencing the accessibility and dissemination of Internet services. Internet service providers tend to allocate resources and prioritize regions that offer economic advantages and have a larger user base. Consequently, the current state of Internet connectivity in the regency indicates that only 75% of villages have access to the Internet. The Internet signal exhibits varying degrees of strength, with 70.7% of users experiencing a strong signal, 18.6% encountering a relatively strong signal, and 10.7% facing a poor signal. The delayed installation of network infrastructure in numerous village government offices can be attributed to inadequate commitment and limitations exhibited by village leaders. On a national scale, Indonesia encounters challenges in the form of a deficiency in Internet penetration, as evidenced by the fact that 13.76% of its villages (11,231 out of 81,616) lack access to the Internet (Village Digital Profile 2021).

The findings indicated that while Internet connectivity was established in all village offices within Banyumas Regency, the quality and speed of the connections varied. However, it was observed that certain villages lacked the necessary infrastructure to effectively facilitate the process of digital transformation. In a similar vein, it should be noted that the availability of Internet access in villages was not uniformly adequate due to the topographical characteristics of hilly and mountainous regions. The presence of these geographical features has presented unique obstacles in the pursuit of achieving equitable dissemination of Internet connectivity. Consequently, the availability of high-speed Internet is constrained to particular areas within villages, predominantly those in close proximity to the local governing body. The existence of disparities in the allocation of ICT network infrastructure has been acknowledged as a notable obstacle to the advancement of digitalization in public services within developing countries, particularly in rural areas.

Adequate allocation of resources, encompassing human resources, ICT network infrastructure, funding, and technology, is imperative for the effective execution of digital transformation initiatives in public services. These resources function as indicators of an organization's capacity to engage in transformation (Lusthaus et al. 2002, 61); in order to fulfill its role as a public entity, it is imperative for the village government to possess them.

Conclusion

1. The findings of this study indicate that local governmental entities in Indonesia, specifically those situated in rural regions, exhibit inadequate levels of preparedness for the process of digital transformation. These governmental bodies need additional time in order to effectively engage in a thorough process of digital transformation.
2. Human resources, particularly the capabilities of village apparatus, influence the occurrence of obstacles during the digital transformation process. In addition, the absence of robust village government infrastructure poses challenges to the effective implementation of electronic services.
3. Based on the obtained results, it is imperative to prioritize the improvement of ICT infrastructure and the expansion of Internet connectivity, particularly in geographically isolated areas that are distant from urban hubs. Moreover, it is imperative to cultivate motivation among village leaders in order to effectively facilitate the implementation of digital transformation endeavors.
4. This study emphasizes the adequacy of the current policies and leadership exhibited by the village heads. Nonetheless, it is crucial to address the challenges that have been identified. To enhance the implementation of public e-services, policymakers should prioritize the enhancement of human resources and digital infrastructure within village governments. Subsequent investigations should strive to adopt a more comprehensive methodology for data collection, such as by implementing a complete enumeration of all villages, in order to procure data that are more accurate and dependable for the purposes of decision-making.
5. In the final analysis, the research findings underscore the imperative for immediate measures to enhance the preparedness of village governments in Indonesia for the process of digital transformation. Indonesia can advance the digital transformation of its public services and ultimately benefit rural communities throughout the country by effectively addressing obstacles pertaining to human resources and infrastructure while simultaneously fostering effective leadership and motivation among village heads.

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KAIMŲ VADOVYBĖS PASIRENGIMAS SKAITMENINIŲ VIEŠŲJŲ PASLAUGŲ TRANSFORMACIJAI BANJUMO REGIONE INDONEZIJOJE

Anotacija. *Šio tyrimo tikslas – įvertinti kaimų vadovybių pasirengimo lygį viešųjų paslaugų skaitmeninei transformacijai. Informacinių ir ryšių technologijų (IRT) pažanga atnešė reikšmingų permainų tiek privačiame, tiek viešajame sektoriuose. Tai suvaidino lemiamą vaidmenį skatinant viešųjų paslaugų modernizavimą regioniniu lygmeniu ir ypatingas dėmesys skirtas kaimų valdymui. Indonezijoje ir kitose besivystančiose šalyse transformacijos procesas susiduria su įvairiais iššūkiais. Šie iššūkiai apima skaitmeninę atskirtį, atsirandančią dėl netinkamo IRT infrastruktūros tinklo, ribotos lyderystės inovacijų srityje ir skaitmeninio raštingumo trūkumo vietos valdžios institucijose. Šiame tyrime buvo taikomas aprašomasis kiekybinis metodas. Tyrime dalyvavo 75 Banjumo seniūnijos kaimų savivaldybės, o surinkti duomenys buvo analizuojami aprašomosios statistikos metodais. Išvados parodė, kad nepakankamas regionų ir kaimų vyriausybių dėmesys ir atsidavimas informacinių ir ryšių technologijų (IRT) pažangai atitinkamose srityse, taip pat ribotos investicijos į vyriausybės darbuotojų skaitmeninių įgūdžių gerinimą paveikė kaimų vyriausybių pasirengimo skaitmeninės transformacijos procesą ir jo lygį.*

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