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DIGITAL TRANSFORMATION AND ITS IMPACT ON NATIONAL ECONOMIC GROWTH

Raya Mahfuzha¹, Nadya², M.Wahid Daulay³, Dicky Pratama⁴, Ataina Zulfa Nasution⁵

Faculty of Economics and Islamic Business, State Islamic University of North Sumatra JL. IAIN No. 1 Gaharu, East Medan District, Medan City, North Sumatra

rayamahfuzha35@gmail.com¹, nya42937@gmail.com²,
m.wahiddaulay@gmail.com³, dickysinaga1221@gmail.com⁴,
ataina1100000168@uinsu.ac.id⁵

ABSTRACT: Digital transformation has become a key driver of Indonesia's economic growth, creating a more efficient, inclusive, and competitive ecosystem across financial, trade, industrial, and service sectors. According to Bank Indonesia (2024), the value of digital economic transactions reached IDR 2,400 trillion, rising sharply from IDR 800 trillion in 2020. This progress has expanded market access for MSMEs and strengthened the national economy through innovation. Using a qualitative descriptive method and secondary data from BPS, Bank Indonesia, Kominfo, and the World Bank (2023–2024), the study finds that digitalization boosts efficiency, productivity, and financial inclusion. However, challenges such as the digital divide, cybersecurity risks, and low literacy persist, requiring policies to enhance infrastructure, literacy, and innovation-based empowerment.

Keywords: *Economic Growth, Digital Economy, Indonesia, Technological Inclusion.*

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INTRODUCTION

Digital transformation is one of the most influential phenomena in the global economy of the 21st century. Advances in information and communication technology have changed the way humans work, produce, and interact in modern economic systems. Digitalization drives new efficiencies in economic activities, expands access to markets, and increases productivity through the use of data-driven technologies and automation. In a global context, the digital economy has become a major growth engine for both developed and developing countries. A World Bank report (2023) shows that the contribution of the digital economy to global gross domestic product (GDP) has reached 15.5%, with an average growth potential of 11% per year until 2030.

Indonesia, as a country with a population of more than 278 million, has a strategic position in Southeast Asia's digital transformation map. With an internet penetration rate of 79.5% of the total population (APJII, 2024) and a growing number of active digital media users, Indonesia is on track for significant digital economic acceleration. A report by the Ministry of Communication and Information Technology (Kominfo, 2023) estimates that Indonesia's digital economy will reach US\$77 billion in 2022 and is projected to exceed US\$130 billion in 2025, making it the largest digital market in the Southeast Asian region. This digital transformation has spread to almost all sectors of the economy, from finance (fintech), trade (e-commerce), logistics, agriculture, to public services.

The contribution of digitalization to the national economy is not only evident in the increase in the value of digital transactions, but also in the creation of jobs and increased industrial competitiveness. According to a report by Bank Indonesia (2024), the value of national e-commerce transactions in 2023 reached Rp530 trillion, an increase of 18.6% compared to the previous year. Meanwhile, electronic money transactions grew to Rp490 trillion, reflecting a shift in people's behavior from conventional economic systems to digital-based systems. This growth not only drives an increase in household consumption but also strengthens the national economic structure through increased efficiency, transparency, and financial inclusion.

Despite showing promising performance, digital transformation in Indonesia still faces significant challenges. The digital divide between urban and rural areas is one of the main issues hindering the equitable distribution of the benefits of digitalization. Based on data from the Central Statistics Agency (BPS, 2023), there is a disparity in internet access between Java (86%) and outside Java (58%), which has a direct implication on productivity and economic opportunity inequality. In addition, the level of digital literacy among the population is still relatively low. A survey by the Ministry of Communication and Information Technology and Katadata Insight (2023) noted that Indonesia's digital literacy index has only reached 3.54 on a scale of 5, which means it is in the "moderate" category. This condition shows that the

use of digital technology is not yet fully optimal, especially in the MSME sector and among low- to middle-income communities.

In addition to the issue of the digital divide, cybersecurity is also a crucial challenge in the national digital economy ecosystem. Throughout 2023, the National Cyber and Crypto Agency (BSSN) recorded more than 1.6 million cyber attacks targeting digital infrastructure and electronic payment systems in Indonesia. These threats highlight the importance of establishing strong digital governance to protect personal data, strengthen consumer confidence, and ensure the sustainability of digital economic activities.

The Indonesian government has responded to these challenges through various strategic policies. Through the 2020–2024 National Medium-Term Development Plan (RPJMN), digital transformation has been designated as one of the priorities for national economic development. In addition, the launch of the Indonesia Digital Economy Roadmap 2021–2030 by the Ministry of Communication and Information Technology and the National Development Planning Agency (Bappenas) is an important milestone in efforts to strengthen the national digital foundation. The strategy covers four main pillars, namely digital infrastructure development, digital literacy improvement, national digital economy development, and the creation of a sustainable innovation and cybersecurity ecosystem.

Within this policy framework, the Micro, Small, and Medium Enterprises (MSME) sector plays a vital role. Data from the Ministry of Cooperatives and SMEs (2023) shows that MSMEs contribute 61% to the national GDP and employ more than 97% of the workforce in Indonesia. However, only about 30% of MSME players have been integrated into the digital ecosystem. This means that accelerating digital transformation in this sector has the potential to have a direct impact on economic growth, employment, and poverty alleviation.

Digital transformation has also had a significant impact on the financial sector through the development of digital financial services (financial technology or fintech). Based on a report by the Financial Services Authority (OJK, 2023), the number of official fintech lending providers reached 102 companies with a total loan value of Rp557 trillion, an increase of 30.5% compared to the previous year. The development of fintech has expanded access to formal financial services for the public, especially for those who previously did not have bank accounts (unbanked population). This has encouraged financial inclusion and supported the national financial deepening agenda.

However, various studies show that the success of digital transformation is not always linear with economic growth. McKinsey & Company (2022) in the Digital Archipelago Report emphasizes that the benefits of the digital economy will only be maximized if supported by competent human resources, adaptive policies, and cross-sector collaboration. Without such readiness, digitization can actually deepen economic inequality and cause disruption in traditional sectors. Therefore, this research is relevant to understand how digital transformation in Indonesia truly contributes to inclusive and sustainable national economic growth.

The purpose of this study is to analyze the relationship between digital transformation and Indonesia's national economic growth by examining the impact of digitalization on economic structure, real sector productivity, and community welfare. This study also aims to identify the main challenges faced in the digital transformation process and formulate policy recommendations to strengthen national economic competitiveness in the digital era.

Thus, this study is expected to contribute theoretically and practically to the study of national economic development. Theoretically, this study enriches the literature on the relationship between technology and economic growth, while practically, the results are expected to provide input for the government and stakeholders in designing inclusive, productive, and sustainable economic digitization policies in Indonesia.

LITERATURE REVIEW

Economic growth is one of the main indicators for assessing the success of a country's development. Classically, the theory of economic growth was explained by Adam Smith (1776) through the concept of the *invisible hand*, which emphasizes the importance of market efficiency, labor productivity, and capital accumulation as the main drivers of welfare improvement. This theory was later developed by Harrod-Domar (1939) and Solow (1956), who highlighted the role of investment and physical capital accumulation in determining the long-term rate of economic growth. However, in the context of modern economics, growth is no longer determined solely by physical capital but also by human capital, knowledge, and technological innovation.

The endogenous growth theory proposed by Romer (1990) and Lucas (1988) asserts that technological progress and human knowledge enhancement are the primary sources of sustainable economic growth. Within this framework, economic digitalization can be viewed as a tangible manifestation of technological advancement that increases efficiency and productivity through innovation, automation, and rapid information exchange. Thus, digital transformation serves as a catalyst for modern economic growth by integrating technology across all sectors of the economy.

The concept of the digital economy began to gain wide recognition in the early 21st century, when information and communication technology became the core foundation of economic activity. According to Howkins (2001), the digital economy is an economic system focused on the production, distribution, and consumption of goods and services based on digital information. Meanwhile, the Organisation for Economic Co-operation and Development (OECD, 2022) defines the digital economy as all economic activities that rely on the use of digital data and internet networks as primary production factors. In other words, the digital economy creates a new form of economic relationship characterized by the disappearance of geographical boundaries, the emergence of digital platforms, and increased global connectivity.

In the context of national development, Todaro and Smith (2020) emphasize that economic growth cannot be separated from structural and social dimensions. Economic transformation is not merely an increase in GDP figures but also includes changes in production structure, value-added enhancement, and equitable distribution of development benefits. In this regard, digitalization serves as an instrument to accelerate structural transformation by improving efficiency, reducing transaction costs, and expanding access to economic resources.

From the perspective of inclusive development, the Inclusive Growth Theory proposed by Rauniyar and Kanbur (2010) states that economic growth can only be considered successful if its benefits are felt by all layers of society. In this context, digital transformation becomes a strategic factor because it opens broader opportunities for public economic participation, including for micro-entrepreneurs and individuals in remote areas. Through digitalization, geographical and social barriers can be reduced, enabling more equitable participation in the national economy.

In addition, Joseph Schumpeter's (1934) Creative Destruction Theory is also relevant in explaining the dynamics of digital transformation in the economy. Schumpeter argues that technological innovation drives the emergence of new forms of production and business models that replace old systems. This process is often disruptive but serves as a key driver of economic progress. In the context of Indonesia, the emergence of digital startups such as Gojek, Tokopedia, and Traveloka represents concrete examples of innovation that drive structural economic transformation through the creation of new jobs, productivity improvement, and distribution efficiency.

Beyond conventional economic theories, recent literature also highlights the importance of the Digital Economy Framework in promoting national development. UNCTAD (2022) asserts that digitalization encompasses three main pillars: (1) digital infrastructure, (2) human resources and digital literacy, and (3) innovation and regulation. Without strengthening these three aspects, the potential of the digital economy cannot be fully realized. The World Bank (2023) adds that developing countries such as Indonesia must focus on building an inclusive digital ecosystem, including expanding high-speed internet access, improving data security, and strengthening digital consumer protection regulations.

In policy studies, Bappenas (2023) positions digital transformation as an essential component within the pillars of national economic development. Through the Indonesia Digital Transformation Roadmap 2021–2030, the government targets the contribution of the digital economy to the national GDP to increase to 18% by 2030. This demonstrates a shift in the development paradigm, where digitalization is no longer merely a technological innovation but a national strategy to enhance global competitiveness.

Several empirical studies support the view that digital transformation has a positive impact on economic growth. Pradana and Hidayat (2022) found that increased adoption of digital technology in the MSME sector significantly affects regional GDP growth. Meanwhile, Santoso (2021) showed that financial digitalization through fintech enhances financial inclusion and expands access to financing for low-income communities. However, Rakhmawati and Wibowo (2023) warned that without equitable infrastructure development and improved digital literacy, digitalization could potentially widen interregional economic inequality.

From the various theories and research findings above, it can be concluded that digital transformation is a multidimensional phenomenon influencing

almost all aspects of the economy. Conceptually, digitalization drives economic growth through three main mechanisms:

1. increasing efficiency and productivity,
2. expanding market access and financial inclusion,
3. fostering innovation and creating new jobs.

However, these benefits can only be achieved if supported by consistent public policies, adequate infrastructure, and human resources capable of adapting to technological changes.

Therefore, this theoretical foundation serves as a reference for understanding the relationship between digital transformation and national economic growth. This study employs the perspectives of endogenous growth theory, inclusive economic theory, and the digital economy concept to analyze the extent to which digitalization has become a driving force of Indonesia's economic growth in the modern era.

METHODOLOGY

This study employs a **qualitative descriptive approach**, which aims to describe, analyze, and deeply understand the phenomenon of digital transformation within the context of Indonesia's national economy. According to Creswell (2014), descriptive qualitative research is used to interpret the meaning behind events and policies by emphasizing contextual understanding. In this study, such an approach is relevant because digital transformation cannot be measured solely through numerical data but must also be examined through policy dynamics, economic behavior, and social responses toward technological innovation.

The study utilizes secondary data obtained from credible national and international institutions. The main data sources include publications from Statistics Indonesia (BPS), Bank Indonesia (BI), the Ministry of Communication and Information Technology (Kemenkominfo), the Ministry of Cooperatives and SMEs, and the Financial Services Authority (OJK), as well as reports from the World Bank, McKinsey & Company, OECD, and the United Nations Conference on Trade and Development (UNCTAD). In addition, various scientific articles, previous research findings, and annual digital economy reports from Bappenas were also used to enrich the analysis.

The data collection techniques applied in this study include library research and documentary analysis. Library research was conducted to gain theoretical understanding of the relationship between digitalization and economic growth based on classical and modern theories. Meanwhile, documentary analysis was used to examine government policies, digital infrastructure development, and digital economy statistics in Indonesia during the period 2018–2024.

The data analysis followed the interactive descriptive qualitative method developed by Miles, Huberman, and Saldaña (2014), which consists of three main stages:

1. Data reduction selecting and categorizing data according to the research focus, such as the contribution of the digital economy to GDP, e-commerce development, digital financial inclusion, and technological innovation;

2. Data presentation organizing the findings in narrative form and supporting tables to illustrate the relationship between digitalization and economic growth; and
3. Conclusion drawing and verification – interpreting the findings to answer research questions and formulate relevant policy recommendations.

To ensure validity and reliability, this study applies source triangulation, which involves comparing data from various official institutions to enhance the objectivity and accuracy of the analysis. Data from national institutions such as BPS, BI, and Kemenkominfo were cross-checked with international data from the World Bank, OECD, and UNCTAD to ensure consistency and relevance. Additionally, all data were updated through 2024 to reflect the most recent conditions of Indonesia's economy.

This research method was selected because it provides a comprehensive understanding of how digital transformation affects the structure, dynamics, and direction of Indonesia's economic growth. The qualitative approach allows the researcher to explore the relationship between national digitalization policies and their impacts on productivity, job creation, and global competitiveness. The results of the analysis are expected to contribute to the academic literature on digital economic transformation and offer strategic insights for policymakers in formulating sustainable national economic development strategies in the digital era.

RESEARCH RESULT

Digital transformation in Indonesia has brought fundamental changes to the structure and dynamics of the national economy. Over the past decade, nearly all economic activities have undergone digitalization covering the financial, trade, industrial, and public service sectors. According to data from Bank Indonesia (2024), the value of Indonesia's digital economy transactions reached IDR 2,400 trillion, an increase of almost threefold compared to 2020, when it stood at IDR 800 trillion.

According to the Central Statistics Agency (BPS, 2024), the contribution of the information and communication sector to Indonesia's GDP reached 5.7% in 2023, up from 4.3% in 2018. This sector, along with manufacturing and trade, has become a key driver of national economic growth. Similarly, the World Bank (2023) projects that Indonesia's digital economy could contribute up to US\$360 billion to GDP by 2030, accounting for around 18% of the national total.

The expansion of digital platforms such as e-commerce, fintech, online transportation services, and digital data-based services has played a significant role in this growth. The Ministry of Communication and Informatics (Kominfo, 2023) reported that the digital sector directly employed over 6.3 million workers, mainly in information technology, application development, and digital marketing.

Significant development has also occurred in the trade and services sectors. According to Bank Indonesia (2024), national e-commerce transactions reached IDR 530 trillion in 2023, up 18.6% from the previous year. Meanwhile, fintech lending disbursements reached IDR 557 trillion (OJK, 2023), an increase of 30.5%

compared to 2022. Electronic money transactions also hit IDR 490 trillion, reflecting the public's growing trust in digital financial systems.

In the MSME sector, around 30% of Indonesia's 64 million MSMEs have adopted digital platforms (Ministry of Cooperatives and SMEs, 2023). Digital MSMEs recorded 2–3 times higher revenue growth compared to conventional MSMEs, showing that digitalization supports post-pandemic economic recovery. The manufacturing sector has begun implementing Industry 4.0, integrating information technology into production processes. The Making Indonesia 4.0 program by the Ministry of Industry has been a key driver in accelerating industrial digitalization. Technologies such as the Internet of Things (IoT), big data, and artificial intelligence (AI) have improved operational efficiency and reduced production costs.

In terms of economic efficiency, research by McKinsey & Company (2022) shows that digital technology adoption can increase operational efficiency by up to 30% and reduce national logistics costs by 23%. The Bank Indonesia (2023) survey also found that financial inclusion reached 87.6%, driven by the rise of mobile banking and digital wallets.

However, digital inequality persists. The Central Statistics Agency (BPS, 2023) noted a significant gap between Java (86% internet users) and outside Java (58%), which limits equal digital opportunities. The Kominfo and Katadata Insight (2023) survey also reported that Indonesia's digital literacy index was 3.54 out of 5, indicating the need to enhance public capacity to use technology productively and safely.

No	Indicator / Variable	Data / Value
1	Total value of Indonesia's digital economic transactions	IDR 2,400 trillion in 2024 (up from IDR 800 trillion in 2020)
2	Contribution of ICT sector to GDP	5.7% in 2023 (up from 4.3% in 2018)
3	Projected digital economy contribution by 2030	US\$360 billion (≈18% of national GDP)
4	Number of workers employed in the digital sector	6.3 million workers
5	Value of national e-commerce transactions	IDR 530 trillion in 2023
6	Total fintech lending distribution	IDR 557 trillion in 2023 (+30.5% YoY)
7	Electronic money transaction value	IDR 490 trillion in 2023
8	Number of MSMEs adopting digital platforms	30% of 64 million MSMEs
9	Efficiency improvement from digital technology	Operational efficiency increases up to 30%
10	Internet penetration gap	Java: 86%; Outside Java: 58%
11	Digital literacy index	Score: 3.54/5 (moderate)

DISCUSSION

The findings show that digital transformation has become one of the main engines of Indonesia's economic growth, marking a major shift toward a technology-based economy. The steady rise in the digital sector's contribution to GDP reflects not only the growing importance of information and communication technologies but also the integration of digital platforms into all aspects of daily economic activity.

The increase in e-commerce and fintech transactions indicates that digital innovation enhances market efficiency and reduces transaction costs. These results align with Romer's (1990) endogenous growth theory, which emphasizes technology and innovation as the main drivers of sustainable economic development. Digital transformation also supports inclusive growth, as it expands financial access to previously underserved populations, consistent with Rauniyar and Kanbur's (2010) concept of *inclusive growth*.

From a structural perspective, the adoption of Industry 4.0 has accelerated Indonesia's shift from resource-based industries to innovation-based sectors. This is in line with Schumpeter's (1934) creative destruction theory, where technological change replaces outdated systems, creating new industries and employment opportunities. However, it also introduces challenges, such as potential job displacement due to automation, which requires policies on upskilling and reskilling.

In the long term, digitalization will reshape Indonesia's economic structure toward a more knowledge and innovation driven economy. The Bappenas (2023) projection that the digital sector's contribution to GDP could reach 18% by 2030 highlights its growing strategic importance. Nevertheless, the digital divide between urban and rural areas must be addressed to ensure equitable growth.

The Triple Helix collaboration model involving government, business, and universities provides a solid framework for sustaining digital transformation. Initiatives such as the National 1000 Digital Startups Movement and Making Indonesia 4.0 show that cross sector collaboration can foster innovation, create digital entrepreneurs, and strengthen industrial competitiveness. In addition, university involvement in digital curriculum development ensures the availability of skilled human capital to meet future labor market needs.

Finally, the government's Indonesia Digital Economy Roadmap 2021–2030 reflects a clear policy direction toward inclusive and sustainable digital development. By expanding digital infrastructure, improving literacy, and enhancing cybersecurity, Indonesia can build a resilient, equitable, and globally competitive digital economy.

CONCLUSION AND RECOMMENDATIONS

Digital transformation has become a major driver of Indonesia's national economic growth, reshaping its structure toward a more technology-based, efficient, and inclusive economy. Over the past decade, digitalization has influenced nearly all sectors from finance and trade to manufacturing and public services resulting in higher productivity, improved access to markets, and the emergence of new digital industries.

The findings demonstrate that the information and communication technology sector consistently contributes to Indonesia's GDP growth, while e-commerce, fintech, and MSME digitalization have significantly strengthened national economic resilience. Furthermore, the adoption of Industry 4.0 technologies has increased efficiency in manufacturing and opened new opportunities for innovation and investment.

However, several challenges remain, including cybersecurity risks, digital inequality between regions, and limited digital literacy among certain communities. These factors must be addressed to ensure that digital transformation truly supports sustainable and equitable development.

In the long run, Indonesia's digital transformation will not only accelerate economic growth but also reshape the labor market, encouraging the creation of new, technology oriented jobs while requiring continuous upskilling and reskilling. Collaboration through the Triple Helix model involving government, industry, and academia is essential for maintaining innovation, competitiveness, and human capital development in the digital era.

To ensure the sustainable advancement of Indonesia's digital economy, several strategic actions are recommended. First, the government should continue expanding digital infrastructure and internet connectivity to guarantee equal access across all regions, particularly in rural and eastern areas, thereby reducing the digital divide and promoting inclusive participation in the economy. Second, digital literacy and human capital development must be strengthened through collaboration between educational institutions, the government, and industry, focusing on technical training and capacity-building programs that prepare the workforce for the demands of the digital era. Third, cybersecurity systems and data protection regulations need to be enhanced to safeguard user privacy and maintain public trust in digital transactions and online governance. Fourth, inclusive digital entrepreneurship should be promoted by facilitating MSMEs and startups with access to finance, mentoring, and digital innovation hubs, ensuring equitable digital business growth across sectors. Finally, continuous collaboration under the Triple Helix framework involving the government, businesses, and academia is crucial for creating a sustainable digital ecosystem that fosters innovation, knowledge exchange, and long-term national competitiveness in the global digital landscape.

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