

Digital Business Transformation: Innovation and Competitiveness Strategies in the Economy 4.0 Era

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ABSTRACT

This study discusses digital business transformation as a strategy for innovation and increased competitiveness in the era of Economy 4.0. The background of this study stems from fundamental changes in the way companies operate, interact with consumers, and utilize digital technology as the main support for business activities. The objectives of this research are to analyze the digital transformation strategies pursued by business actors, identify the challenges faced, and formulate implications for competitiveness at the national and global levels. The research method used is a qualitative approach with a descriptive-analytical method. Data was collected through literature studies, in-depth interviews with business actors and experts, and non-participant observation of digital business practices in the e-commerce, fintech, and MSME sectors. Data analysis was carried out through the stages of reduction, presentation, and conclusion drawing using source triangulation techniques to ensure the validity of the findings. The results of the study show that digital transformation provides great opportunities to expand markets, improve efficiency, and create new innovation-based business models. However, the main challenges that arise include the internet access gap, low digital literacy, limited human resources, and data security threats. These findings confirm that the success of digital transformation depends not only on technology but also on the readiness of an ecosystem involving collaboration between the government, the private sector, academia, and the community. The implications of this research emphasize that digital business transformation is key to competitiveness in the global era, but it must be accompanied by inclusive strategies, supportive policies, and sustainable investment in human resource development. Thus, digital transformation can be a driving force for sustainable and equitable national economic growth.

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1. INTRODUCTION

The development of digital technology in the last two decades has brought significant changes to human interaction patterns, economic systems, and global business dynamics (Amory, Mudo, & J, 2025, pp. 32–35). The Economy 4.0 era is marked by the emergence of advanced technologies such as the Internet of Things (IoT), big data analytics, artificial intelligence (AI), blockchain, and cloud computing, which accelerate the digitalization process in various sectors. This transformation has made technology not just a tool, but the main foundation in building a competitive, adaptive, and sustainable business ecosystem.

In the business world, digital transformation is changing the way companies operate, interact with consumers, and create added value (Maria, Rizky, & Akram, 2024, pp. 184–187). Whereas competitive advantage was previously determined more by capital, physical resources, or distribution networks, the ability to innovate through digital technology is now the main factor. This is evident in the growing trends of e-commerce, digital marketing, the use of data for consumer behavior analysis, and the application of automation in production and service processes. These changes require companies to reorient their strategies to remain relevant in an increasingly competitive global market.

Indonesia, as one of the countries with the largest population in the world, faces enormous opportunities and challenges in digital business transformation. A report by the Indonesian Internet Service Providers Association (APJII) shows that the number of internet users continues to increase every year, and most of the community's economic activities have shifted to digital platforms (Harahap, Sari, Naibaho, Harefa, & Naibaho, 2025, pp. 6065–6070). This phenomenon has encouraged the growth of an increasingly diverse digital economy ecosystem, ranging from e-commerce and financial technology (fintech) to digital service-based startups. This condition has created great opportunities for micro, small, and medium enterprises (MSMEs) to expand their markets and increase productivity. However, on the other hand, the digital transformation process also faces a number of challenges.

Low digital literacy among some communities, limited technological infrastructure in remote areas, data security issues, and regulations that do not fully support the digital ecosystem are obstacles that need to be overcome (Fitriyono & Saputra, 2024, pp. 46–57). Additionally, global competition requires companies to not only adopt technology but also develop innovation strategies that align with consumer needs, market trends, and the ever-changing dynamics of the global economy.

Digital business transformation also requires a paradigm shift in human resource management (Angga Wahyudi et al., 2023, pp. 106–109). Employees are no longer only required to have technical skills, but also digital literacy, creativity, and the ability to adapt to technological changes. Thus, digital transformation is not only limited to the use of technology, but also concerns changes in organizational culture, leadership patterns, and more collaborative and data-driven ways of working.

Therefore, a study on Digital Business Transformation: Innovation Strategies and Competitiveness in the Era of Economy 4.0 is highly relevant. This study aims to analyze how innovation strategies can be effectively implemented by businesses in the face of digital disruption, as well as how competitiveness can be improved through the use of technology. The results of this study are expected to contribute both theoretically, through the development of literature on digital business, and practically, as recommendations for business actors, policy makers, and academics in formulating appropriate digital transformation strategies in the Economy 4.0 era.

2. METHODS

This study uses a qualitative approach with a descriptive-analytical method. This approach was chosen because the issue of digital business transformation cannot only be viewed from a quantitative perspective, but also requires a deep understanding of the processes, strategies, and dynamics experienced by business actors in facing the era of Economy 4.0. The descriptive-analytical method

allows researchers to describe the phenomenon of as it is while analyzing the factors that influence it, thereby providing a comprehensive picture of innovation strategies and the competitiveness of digital businesses.

The research subjects consist of business actors who have implemented digital business models, both in the micro, small, and medium enterprise (MSME) sector and in technology- based companies (startups). The subjects were selected purposively, taking into account their direct involvement in the business digitalization process. Thus, the data obtained is expected to provide a true representation of the transformation that is taking place in the field. The research focuses on how business actors adopt digital technology, the innovations they implement to create added value, and the strategies they pursue to enhance competitiveness amid global competition.

Data collection was conducted using several techniques. First, a literature study, which involved reviewing various sources such as books, scientific journal articles, industry reports, and secondary data published by official institutions such as APJII, BPS, and McKinsey, to obtain an overview of the development of digital business. Second, in-depth interviews with a number of key informants, including business actors, digital business practitioners, and economic experts. These interviews were conducted in a semi-structured manner so that researchers could explore broader and deeper information according to the experiences and perspectives of each informant. Third, non-participant observation, which involved directly observing digital business practices on e-commerce platforms, fintech, and other technology- based services to see the innovation strategies implemented and how interactions with consumers took place.

The collected data was then analyzed using a qualitative analysis model proposed by Miles and Huberman, which consists of three stages (Qomaruddin & Sa'diyah, n.d., pp. 80–83). First, data reduction, which involves sorting, filtering, and summarizing data relevant to the research focus so that no information deviates from the purpose of the study. Second, data presentation, where the analysis results are presented in the form of narrative descriptions, tables, and charts to clarify the relationship between the variables studied. Third, drawing conclusions and verification, which is formulating the findings and interpreting the data so that it can answer research questions regarding innovation strategies and competitiveness in digital business transformation.

To ensure data validity, this study uses triangulation techniques, both source triangulation and method triangulation (Susanto, Risnita, & Jailani, 2023, pp. 55–60). Source triangulation was conducted by comparing information from various different sources, while method triangulation was conducted by combining the results of interviews, observations, and literature studies. In this way, the validity and reliability of the data can be better ensured so that the research findings have a high level of credibility.

3. FINDINGS AND DISCUSSION

Research shows that digital business transformation in Indonesia has experienced rapid growth in recent years. This is marked by an increase in the number of internet users, high smartphone penetration, and an increasingly diverse range of digital-based services. Data from APJII (2023) shows that internet users in Indonesia have reached more than 215 million people, or around 78% of the total population (Sainap, 2025, pp. 377–378). This condition is the main capital for digital economic growth, especially in the e-commerce sector, technology-based financial services (fintech), and various innovative startups emerging in various regions.

From interviews with MSME entrepreneurs, it was found that business digitalization has helped them expand their market reach, reduce operational costs, and increase access to consumers. Most MSMEs utilize social media such as Instagram, Facebook, and TikTok as digital marketing tools. Meanwhile, large-scale companies tend to adopt big data analytics, customer relationship management (CRM), and automation systems to strengthen their competitiveness.

Field observations also show a trend in consumer behavior shift. Consumers now prefer to transact through digital platforms because they are considered more practical, faster, and safer. They

also pay great attention to customer experience, so companies are required to innovate in providing personalized and interactive services. These findings are in line with modern consumer behavior theory, which states that customer preferences in the digital age are not only determined by price and quality, but also by ease of access, speed of service, and trust in security systems (Febriani & Dewi, 2019).

However, this study also found a number of obstacles. First, there is still a digital divide between businesses in urban and rural areas. Businesses in urban areas are relatively quicker to adopt digital technology because they have better internet access, while in rural areas digital transformation is slow due to infrastructure limitations. Second, low digital literacy among some MSME players is an obstacle to optimizing technology. Many businesses only use social media in a simple way without a mature digital marketing strategy. Third, data security and privacy issues are quite concerning, given the increasing number of cases of consumer data leaks on digital platforms.

In addition, in terms of human resources, there are still many workers who are not ready to face digital transformation. Interviews with business practitioners show that digital skills, creativity, and adaptability are the main competencies that workers must have in the digital era. Without mastery of these skills, both companies and workers risk falling behind in global competition.

Discussion

Digital business transformation in the era of Economy 4.0 can be understood as a fundamental change in the way companies create value, interact with consumers, and manage resources (Ifadhila et al., 2024). The results of this study show that the adoption of digital technology is not only an option, but a necessity to survive in global competition. This phenomenon is in line with the digital transformation framework concept, which emphasizes that digital transformation involves four main dimensions: business strategy, operational model, customer experience, and organizational culture. These four dimensions are interrelated and cannot stand alone, so companies are required to take a holistic approach to digital transformation (Baskoro, 2025). From the perspective of Schumpeter's theory of innovation, digital transformation can be understood as a form of creative destruction that creates new opportunities while eliminating old business models (Wafa & Damanhuri, 2025, pp. 546–548). The emergence of e-commerce platforms such as Tokopedia, Shopee, and Bukalapak, for example, has shifted consumer patterns from conventional shopping to online shopping. Similarly, fintech services such as OVO, GoPay, and Dana have accelerated the occurrence of digital financial inclusion, which was previously difficult to achieve for people without access to banks (Amory et al., 2025). This shows that digital innovation acts as a catalyst in driving efficiency, affordability, and market expansion.

However, this study also shows that there are some gaps in how digital transformation is being implemented. The digital divide is a big issue, because differences in internet access and digital literacy make it harder for businesses in rural areas to compete with businesses in cities. APJII data shows that although national internet penetration has reached more than 78% of the population, its distribution is still uneven. Java and Bali are the regions with the best internet access, while eastern Indonesia still lags behind. This condition has a direct impact on the ability of MSME players to utilize technology (Fathimatuzzahra & Dompak, 2024). Therefore, digital transformation is not only a matter of technology, but also a matter of equitable development.

In addition to access, digital literacy is also a determining factor in the success of transformation. The interview results show that many MSME players only use social media for promotion, without a structured digital marketing strategy. In fact, effective digital marketing requires the ability to analyze customer data, segment the market, and design content strategies that meet consumer needs (Silaen, Bachtiar, Silaen, & Parhusip, 2024, pp. 1074–1078). Without these skills, MSME players have the potential to become passive users of technology, rather than innovators capable of creating added value. Therefore, digital literacy education programs must be prioritized, both through formal training from the government and collaboration with the private sector.

Another issue that needs to be addressed is data security. With the increase in digital

transactions, the risk of cybercrime, online fraud, and data leaks is also increasing (K.n & Nasution, 2024, pp. 111–115). Several cases of data leaks in Indonesia, including those involving the data of large platform users, have reduced public trust in digital services. This underscores the importance of personal data protection and the implementation of strict cybersecurity standards. This is where government regulations play an important role, for example through the recently passed Personal Data Protection (PDP) Law. However, this regulation still requires clear technical implementation in order to truly protect consumers while encouraging companies to be more responsible in managing digital data.

From a human resources perspective, digital transformation has major implications for workforce competencies. In the context of human capital theory, digital skills, creativity, critical thinking, and adaptability are core competencies that must be possessed in the digital era (Aisa & Aziz, 2025, pp. 429–433). Many companies are now conducting reskilling and upskilling to prepare employees for technological changes. However, research shows that most MSMEs are still constrained by limited resources to conduct continuous training. This creates a skill gap that has the potential to weaken competitiveness. Therefore, support from the government and educational institutions is crucial to provide access to training and digital skills certification.

Furthermore, digital transformation also requires organizational cultural change. Many traditional companies fail in transformation not because of technology, but because of internal resistance. Rigid bureaucratic cultures often hinder the flexibility and collaboration that characterize digital businesses (Nurharyoko et al, 2020). Therefore, change management needs to be a focus so that organizations can adapt quickly. Leadership models must also shift from an authoritative style to a more participatory, collaborative, and innovation-based style. Thus, digital transformation is not only about technological tools, but also about transforming values, mindsets, and work culture (Ayu, Zulkarnaen, & Fitriyanto, 2022, pp. 22–24).

From an opportunity perspective, digital transformation offers various strategic advantages. First, it opens up global markets without geographical barriers. Indonesian local products can now be marketed overseas through international e-commerce platforms. Second, it gives rise to new business models such as platform business models that enable the creation of a collaborative economic ecosystem, where companies not only sell products but also provide a space for interaction between producers and consumers. Third, it accelerates financial inclusion through fintech, which not only facilitates payments but also opens up access to credit for small businesses. In other words, digital transformation can be a driver of inclusive economic growth if managed properly.

However, the success of digital transformation is largely determined by the support of a healthy ecosystem. The government acts as a regulator and facilitator through policies that support infrastructure, security regulations, and innovation incentives. Academics play a role in developing literature, research, and providing competent human resources. Meanwhile, the private sector acts as the driving force behind innovation and technology provision. This cross-sector collaboration is an absolute requirement for digital transformation to become not just a passing trend, but a long-term strategy to strengthen the nation's competitiveness in the global arena (Ayu et al., 2022).

Thus, this discussion confirms that digital business transformation in the era of Economy 4.0 is a multidimensional phenomenon involving aspects of technology, business strategy, digital literacy, regulation, organizational culture, and collaboration between actors. Innovation is indeed key, but the sustainability of transformation depends heavily on the readiness of the ecosystem. If these opportunities and challenges can be managed well, then digital transformation will not only increase the competitiveness of companies, but also contribute to inclusive and sustainable national economic growth.

4. CONCLUSION

Digital business transformation in the era of Economy 4.0 has become an inevitability that cannot be avoided by business actors, both large-scale and MSMEs. Research results show that the success of

transformation is largely determined by a company's ability to adopt technology, design innovation strategies, and build sustainable competitiveness. The presence of digital technology has not only changed consumption patterns and transaction methods, but has also encouraged the emergence of new business models that are more inclusive, efficient, and competitive.

However, digital transformation also presents a number of challenges. The gap in internet access, low digital literacy, limited human resources, and data security issues are obstacles that need to be addressed seriously. Without proper handling, digital transformation risks creating inequality and widening the competitiveness gap between businesses.

Therefore, strategic collaboration between the government, private sector, academia, and society is needed to build a healthy digital ecosystem. The government plays a role through regulatory policies and infrastructure provision, while the private sector is the engine of innovation, and academics support research development and human resource competency improvement. If this synergy is established, digital business transformation will not only be a tool to strengthen corporate competitiveness, but also a major driver of sustainable and inclusive national economic growth.

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