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MSME Business Transformation in the Digital Era: Digital Innovation as a Driver of Inclusive Business Models in Indonesia

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Abstract

The digital transformation of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia represents a crucial driver of economic growth and innovation in the country's evolving business landscape. This research examines the role of new technologies in promoting inclusive practices by Indonesian MSMEs, with an emphasis on their current adoption, the difficulties they face, and the opportunities ahead. Using a combination of systematic literature review, case study analysis, and an examination of current policy efforts, this study looks at the present situation of digital transformation among Indonesian MSMEs and discovers what helps them develop inclusive business models. The study shows that while adopting digital technology helps MSMEs expand their market, work more efficiently, and make better profits, these small businesses have to handle substantial challenges, such as limited resources, not having the technical skills required, and insufficient infrastructure. It is explained that with government help, working with other types of businesses and sharing resources, MSMEs are able to use technology to become more competitive and encourage inclusive growth. This study contributes to understanding the intersection of digital innovation and inclusive business models in the context of Indonesia's economic development priorities.

Keywords: *Digital Innovation, Digital Transformation, Inclusive Business Models, Indonesia, MSMEs*

INTRODUCTION

In Indonesia, MSMEs form the base of the country's economy, with 99 percent of all businesses and over 95 percent of workers working in them [1]. Despite their significant economic contribution, generating approximately 56 percent of Indonesia's GDP, these enterprises often lag behind larger corporations in adopting modern digital technologies [2]. This digital divide presents both challenges and opportunities in Indonesia's rapidly evolving business landscape, particularly as the global economy increasingly shifts toward digitalization. Digital changes to how traditional MSMEs operate have become important for sustainable development and fair growth in Indonesia.

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When businesses undergo digital transformation, they introduce new technology tools into their work, which greatly changes their approach to business and serving consumers [3]. MSMEs in Indonesia need to apply digital technology which can include such services as basic electronic payments, advanced e-commerce tools and analysis of their data. Purnomo et al. found that digital transformation gives benefits to Indonesian MSMEs, such as wider market access, higher operational efficiency, and improved earnings [4]. At the same time, this process has its challenges, as many new businesses have trouble getting enough resources, learning the necessary skills, and securing their data.

When underserved people are intentionally added to company value chains as consumers, producers, or business owners, it becomes possible to overcome poverty and build a strong economy [5]. When connected to digital growth, these models form important engines for socio-economic development. According to Abdillah, increasing numbers of Indonesian MSMEs are moving toward digital solutions, but integration is being slowed by certain factors, mainly cost issues, a lack of digital skills, and a lack of modern technology and facilities [1][6]. It is therefore very important to learn how digital innovation can foster the growth of inclusive business models among MSMEs in Indonesia.

What's important about this research is its focus on how digital technology can contribute to more inclusive business practices among small and medium enterprises in Indonesia. By looking into using digital technologies to make businesses more sustainable and inclusive, this study helps with both research and policy in MSME development. The lessons gained from this research can be used by Indonesia to shape its policies, company strategies, and support for MSMEs' digitalization.

The main ideas for this study are based on literature focused on digital innovation, business model changing, and inclusive development. With digital innovation, businesses can use digital tools to introduce new products, services, or methods that disrupt previous markets or create new ones. A business model transformation is the process of rethinking how companies make, deliver, and collect value due to changes in the market or technological world. The focus of inclusive economic development is to create growth that helps all people, including those who are marginalized or served last. This study will review how developments in the digital sector encourage MSMEs to become more inclusive and sustainable.

Although much study has been done on digital transformation in Indonesian MSMEs, there is still a large gap in knowledge about how digital change impacts inclusive business models. As Tambunan and Busnetti note, the digital transformation process in MSEs in Indonesia is still a "black box," with existing findings regarding digitalization in this business group remaining limited and fragmented [1]. The purpose of this research is to look at how digital innovations link to the creation of inclusive business models by Indonesian MSMEs.

This paper starts by presenting background information on MSMEs in Indonesia, their digital challenges and opportunities, and what inclusive business models are. This section describes how the study was done, what data were collected, and how they were examined. The findings are organized in the results and discussion section around digital adoption by Indonesian MSMEs, primary digital solutions giving impetus to their development, examples of digital transformation cases, various business models that support inclusivity, obstacles to digitalization, and recommendations for public policies. The final part of the report reviews the important findings, considers their role in inclusive business model design, and advises on possible future research.

METHOD

The research uses a combination of methods to thoroughly study how digital innovation supports inclusive business models for Indonesia's MSMEs. The methodology combines qualitative and quantitative research techniques to capture both the breadth and depth of the digital transformation phenomenon in Indonesia's MSME sector. Combining findings from two data

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sources involves triangulation, improving how valid and reliable the research results are.

The main approach used in this study, pragmatism, looks at how ideas can be applied in the real world, not only what they mean in theory. The framework is effective for learning about digital transformation in small and medium companies by underlining the usefulness of research results for both businesses and laws. To accomplish this, the research uses qualitative data first, analyzing it to find main themes, and builds on these findings with the help of quantitative data analysis.

Different data collection methods are used to provide complete coverage of what we are exploring. First, the process described by Purnomo et al. was used to do an SLR, with each phase being planned, implementation, and reporting [4]. A set of publications from January 2020 to May 2024 was examined in the SLR, all related to digital change among Indonesian MSMEs. This timeframe helps the researchers include the latest knowledge in the field, with an emphasis on developments related to COVID-19, which encouraged many businesses to use technology.

Next, case studies were used to study successful digital transformations within Indonesian MSMEs. The studies we chose were chosen according to varying sectors, locations, and their use of new technology. For every case study, there was a thorough look at the way the business model was changed, the digital tools used, the distribution challenges met, and the results seen. By following this approach, we can see clearly how MSMEs go through digital transformation and create models that include different people.

In addition, I used data from the Central Statistics Agency (BPS) of Indonesia, as noted by Tambunan and Busnetti [1]. We looked at numbers showing how MSMEs are using the internet, are involved in e-commerce, and are using digital payment methods. Secondary data analysis lets us see digital transformation trends in the Indonesian MSME sector, while case studies look at them more specifically.

In the fourth part, policy reviews analyzed how the government facilitates the digitalization of MSMEs [7]. Part of the research was looking at each country's digital economy plans, support for MSMEs, and the regulations related to digital business activities. The policy analysis helps contextualize the research findings within Indonesia's broader economic development agenda and identify potential leverage points for enhancing inclusive growth through MSME digitalization.

The research team used a method of selecting case studies and policy documents, aimed at those providing the best information for answering the research questions [8]. The data available in the Business Statistics System showed where the focus for sampling could be placed on MSMEs by considering size, industry, and location.

How data was analyzed was determined by the type of information collected. After analyzing qualitative data from the reviewed literature, case studies, and policy papers, thematic analysis helped us spot repeating subjects related to digital innovation and including all clients in business models. Did this by organizing the data into codes, organizing the codes under themes, and analyzing the links between the themes. We looked at descriptive statistics to find trends in how small and medium enterprises have adopted digital tools and services.

RESULTS AND DISCUSSION

In Indonesia, the digital change affecting MSMEs is full of possibilities, hurdles, and issues for developing inclusive business models. The following section explains the results of our research, arranged by main themes that show how digital innovation supports inclusive business models in Indonesia.

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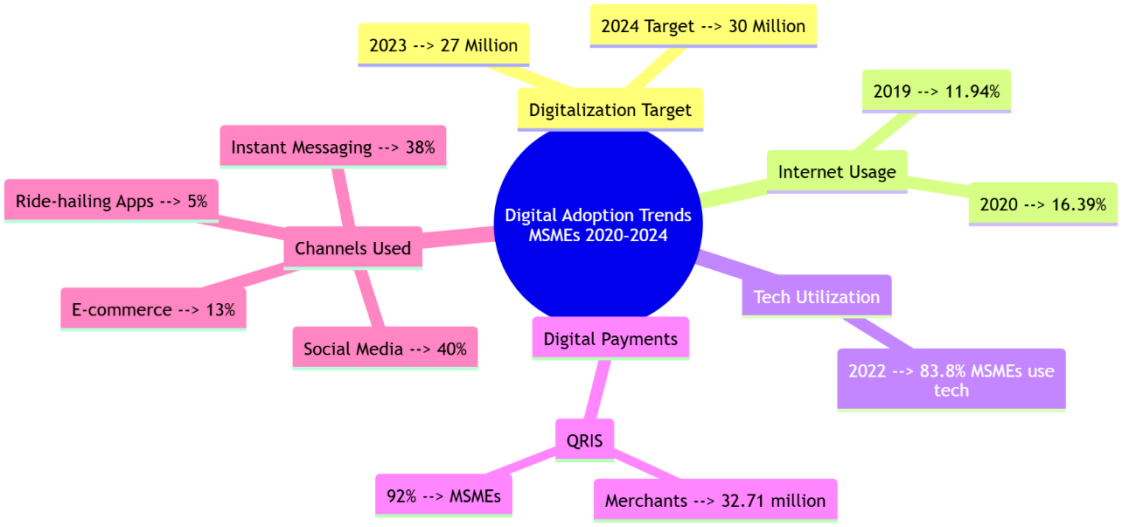

Figure 1. Digital Adoption Trends Among Indonesian MSMEs (2020–2024)

Current State of Digital Adoption Among Indonesian MSMEs

Reviewing Central Statistics Agency data shows that Indonesian MSMEs have made strides in online adoption, yet there are still noticeable gaps and problems. According to their research, while more MSMEs are using the internet, Indonesian MSEs are not as good at adopting advanced digital technologies compared to other regions [1]. The situation is most serious when we compare micro and small enterprises with medium and large ones, because smaller companies typically have more obstacles to adopting digital solutions. Data from the report shows that industries are using digital technology to different extents. The trading sector MSMEs, which make up around 80% of all MSMEs in Indonesia, are more likely to use digital payment tools and marketing on social networks. However, manufacturing MSMEs generally show less use of digital technology overall, but make more use of specific tools connected to their production and inventory when they use technology [9]. Many urban service-based MSMEs are enthusiastic about digital transformation, often using several digital resources to both improve services and interact with customers. There are differences in internet adoption by area, with businesses in Java's bigger cities, such as Jakarta, Bandung, and Surabaya, having much higher rates than outlying islands or rural businesses. This digital gap in geographical terms reflects a larger trend of infrastructure and economic centers being few in Indonesia. Based on Purnomo et al., such differences make it difficult for MSMEs to fully benefit from digital transformation [4].

Key Digital Innovations Driving MSME Transformation

Our research identifies several key digital innovations that are driving business model transformation among Indonesian MSMEs. E-commerce platforms and marketplace integration represent the most widely adopted digital innovation, with platforms such as Tokopedia, Shopee, and Bukalapak providing MSMEs with access to expanded customer bases and streamlined sales processes. According to Siregar et al., MSMEs that successfully integrate with these platforms

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often experience significant increases in sales volume and geographical market reach, contributing to more inclusive growth patterns by connecting rural producers with urban consumers [10]. Digital payment solutions constitute another critical innovation area, with services like OVO, GoPay, and DANA enabling MSMEs to offer cashless transaction options to customers. The adoption of these solutions not only improves operational efficiency but also enhances financial inclusion by bringing previously unbanked or underbanked MSME owners into the formal financial system. Abdillah notes that digital payment adoption often serves as an entry point for further digital transformation, as MSMEs become more comfortable with basic digital tools and recognize their tangible benefits [6].

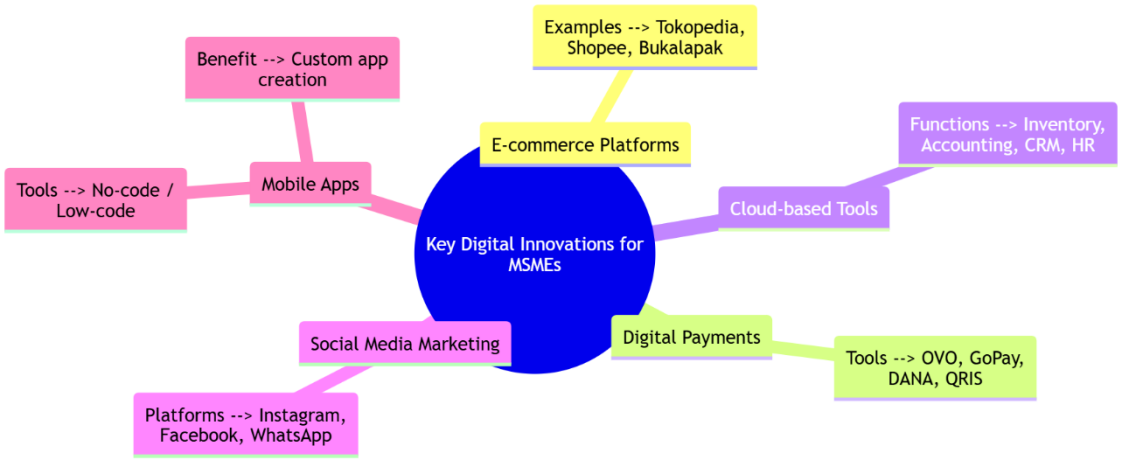

Figure 2 Key Digital Innovations Driving MSME Transformation

Cloud-based business management tools represent a more advanced category of digital innovation, with applications for inventory management, accounting, customer relationship management, and human resources increasingly available to MSMEs through affordable subscription models. These tools enable MSMEs to professionalize their operations and make data-driven decisions, enhancing their competitiveness and resilience. However, adoption of these more sophisticated tools remains limited primarily to medium-sized enterprises and growth-oriented small businesses with higher digital literacy levels [11]. Social media marketing and customer engagement platforms have emerged as particularly important digital innovations for Indonesian MSMEs, with platforms like Instagram, Facebook, and WhatsApp Business serving as primary channels for product promotion, customer communication, and brand building. The visual nature of platforms like Instagram aligns well with product-based MSMEs, while the messaging functionality of WhatsApp facilitates personalized customer service. These platforms offer low-cost, high-impact marketing solutions that are accessible even to micro-enterprises with limited resources.

Mobile applications for business operations represent an emerging area of digital innovation, with custom and template-based apps enabling MSMEs to streamline processes, enhance customer experiences, and collect valuable data. While app development was previously beyond the reach of most MSMEs, the proliferation of no-code and low-code development platforms has made this innovation more accessible. However, as Purnomo et al observe, adoption remains concentrated among more digitally mature MSMEs with clear use cases and return on investment calculations [4].

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Case Studies of Successful Digital Transformation

Our analysis of case studies shows that Indonesian MSMEs have achieved success with digital transformation, each following a unique approach to becoming more inclusive through digital activities. The shift from a traditional store to omnichannel selling can be seen with a batik retailer in Solo, Central Java, where the company now uses both online and brick-and-mortar methods. Using e-commerce, digital inventory and data analysis, this MSME grew its number of customers across the country and internationally, but still kept its local traditions and helped traditional artisans. This model change included the rural batik industry by linking these producers to urban and international buyers who were previously hard to reach.

Table 1 Case Studies of Successful Digital Transformation

Sector	Case Study Description
Retail	A batik retailer in Solo transformed from a physical store to an omnichannel business, adopting e-commerce platforms and digital inventory management, expanding its customer base nationally and internationally.
Agriculture	A coffee cooperative in Aceh utilized digital traceability systems and online marketplaces to access premium markets, increasing farmer incomes and promoting sustainable practices.
Services	A women-led catering business in Surabaya implemented digital ordering systems and social media marketing, scaling operations and providing employment opportunities for disadvantaged women.

Agricultural micro, small, and medium enterprises that use digital platforms show a different way to create inclusive business models. Aceh's coffee cooperative demonstrates how new ways of tracking goods, accessing markets, and advertising online helped small farmers enter premium markets by showing the source and quality of what they sell. Through digital transformation, both farmers' earnings and the protection of the environment benefited from being able to document the supply chain. With this business model, farmers from disadvantaged regions benefited, and growing numbers of consumers found what they wanted in ethically sourced goods. Digital tools in service-based MSMEs are demonstrated by the example of a catering business in Surabaya led by women who improved their activities with digital ordering, cloud recipes, and social media advertising. Thanks to digital transformation, the business grew, became more reliable, and provided new employment for women where it operates. This business model stands out in its effort to recruit women facing difficulties and supply them with new digital skills upon hiring them.

Thanks to digital transformation, these case studies show how MSMEs can help marginalized groups by providing work, necessary products and services, and pushing for efforts to protect the environment. They also point out that digital transformation outcomes are affected by things like sector details, local services, and entrepreneur skills.

Inclusive Business Model Innovations

Through our research, we have discovered some important trends of inclusive business model innovation that result from digital changes in Indonesia's MSMEs. These examples emphasize the usefulness of digital technologies for building the economy and handling challenges concerning society and the environment. Making business models more accessible to areas where

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people need help is a major form of inclusive business innovation. MSMEs can now use digital methods to bring their products or services to customers in communities that used to have little access. For instance, using mobile learning, educational MSMEs are making better educational material more accessible in rural districts. Likewise, many small and medium health enterprises have helped reach essential healthcare to areas that lack well-built healthcare facilities with the use of telemedicine platforms. With digital technology, companies address inaccessibility, bring positive change to society, and increase their business prospects.

Table 2 Inclusive Business Model Innovations Enabled by Digital Transformation

Innovation Type	Description
Improved Accessibility	Digital platforms extended products and services to underserved communities, such as educational content through mobile learning applications and healthcare via telemedicine.
Cost Reduction Strategies	Digitization reduced operational costs, allowing MSMEs to offer affordable products and services to lower-income consumers.
Collaborative Digital Ecosystems	Platforms connected MSMEs in complementary value chains, enabling collective action and resource sharing, enhancing competitiveness.
Knowledge Sharing Platforms	Digital platforms facilitated peer learning, mentorship, and skill development, overcoming knowledge barriers and promoting business growth.

Business models can be improved inclusively by using digital tools that help reduce costs. When MSMEs go digital and cut out the middlemen, they lower their costs and can give lower-income individuals access to affordable goods and services. Selling produce digitally from farm to customer has helped MSMEs cut their expenses, allowing them to sell fresh food at reduced prices to consumers and preserve steady profits for farmers. Just like the case with digital banking, digital financial services for MSMEs have made insurance and microloan products more obtainable for people previously unable to use them. You can see from these business models that improved digital systems can allow more people to take part in the market. The growth of collaborative digital ecosystems in MSMEs points to them being one of the most promising forms of inclusive business model innovation. With digital support, MSMEs in complementary roles can work and share resources together, which is often impossible for a single enterprise. To illustrate, a digital tool linking textile producers, designers, and retailers in West Java has built an environment where they exchange knowledge, organize production, and reach markets together. The same holds in Bali, where tourism MSME groups have created digital cooperatives to provide complete packages for tourists to compete with bigger organizations. By relying on new technology, these models aim to solve the main problems large companies have with MSMEs.

Knowledge transfer and capacity development platforms are a extra type of newly emerging inclusive business models. Digital learning tools that provide mentoring and training help MSMEs grow despite the knowledge strengths they may have. A website where experienced entrepreneurs share knowledge with East Java startup founders has led to a useful knowledge exchange system that speeds up business development and benefits women and youth entrepreneurs. In the same way, groups of craftspeople on the internet in Yogyakarta have helped preserve traditions and provided chances for new ideas and increased sales. They depend on digital tools to give more people access to knowledge that supports business success.

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Challenges and Barriers to Digital Transformation

While digital transformation has helped some Indonesian SMEs become more inclusive, our study also found that there are serious hurdles that keep digital adoption from spreading more widely among them. People's digital skills and access to information are major obstacles preventing digital change. Abdillah found that many MSME owners and employees are missing the basic digital knowledge needed to make good use of technology [6]. Older business owners, people who have not completed higher education, and people living in rural locations without a lot of digital information often struggle the most with this challenge. Asking for digital skills isn't enough today; companies also look for workers with data analysis, digital marketing, and cybersecurity knowledge to stay competitive.

Table 3 Challenges and Barriers to Digital Transformation

Barrier Type	Description
Digital Literacy Gaps	Many MSME owners and employees lack basic digital skills, hindering effective adoption and utilization of digital technologies.
Infrastructure Limitations	Inadequate internet connectivity and power supply, especially in rural areas, limit digital transformation efforts.
Financial Constraints	Limited capital and thin profit margins make it challenging for MSMEs to invest in digital technologies.
Regulatory Challenges	Complex and evolving regulations related to digital business operations create compliance burdens for MSMEs.

Inequitable access to infrastructure is a big barrier to digital transformation in rural and remote places. Despite significant improvements in Indonesia's digital infrastructure in recent years, many areas still face challenges with internet connectivity, reliability, and speed. According to Tambunan and Busnetti [1], because of a lack of digital infrastructure in some regions, MSMEs in those places have difficulty accessing the digital economy and building models that are fair to all. Regular shutdowns of electricity can disrupt digital activities in many parts of the world and lower confidence in their digital services. Money is also a major ambition behind digital transformation. Because capital and profit margins are not ample for micro and small enterprises, they often give low priority to digital technology. Although some digital tools cost little to start with, full digital transformation usually demands spending money on hardware, software, learning, and regular maintenance. As Purnomo et al. [4] observe, these financial constraints can create a "digital transformation trap" where MSMEs recognize the importance of digitalization but lack the resources to implement it effectively, potentially widening the gap between digitally mature and lagging enterprises.

Following regulations can be difficult for small businesses, but the rules also support their transformation to digital practices. Some regulations—for example, on data privacy, electronic transactions, and taxation—can be so strict that they complicate life for smaller businesses. Meanwhile, helpful laws can promote digital adoption by earning trust, aligning methods, and providing rewards. According to Siregar et al., Indonesia's regulatory environment for digital business is still evolving, creating uncertainty that can delay digital investment decisions among risk-averse MSME owners.

Suggestions for Policy Makers

Our analysis of the opportunities, challenges, and patterns of inclusive business model

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innovation through digital transformation indicates certain policy recommendations and implications to help Indonesian MSMEs go digital for all. Extra government help should be designed specifically for each group of MSMEs to overcome their main difficulties. MSMEs that struggle to invest in digital tools may find it easier through grants, subsidies, or tax help offered by the government. Pre-planned programs that show users and businesses how to use technology can help overcome any digital skill gaps. If regulatory measures are simplified for digital transformations of MSMEs, the companies can comply more easily and go formal. In line with Purnomo et al., these support systems should be attuned to include rural MSMEs, MSMEs run by women and youth, and older sectors, as they are less likely to go digital.

A strong public-private partnership can accomplish digital inclusion faster and make the transformation more inclusive. Partnerships with government offices, technology firms, banks, and non-government organizations enable groups to tackle difficult problems together. For instance, joint efforts by telecom firms and town councils can increase internet access in areas without it. By joining forces, technology companies and schools can create digital learning programs that serve every student. MSME digital investments can be supported by creating financing products through the partnership of financial institutions and fintech companies. Teaming up allows organizations to create better and longer-lasting support than just one group could offer.

Investing in teaching people digital skills supports a lasting move toward a more inclusive digital future. Starting at the primary level, formal schools should help students develop digital networking and skills so that they are ready for any job or business venture after graduation. Many community organizations, online educational platforms, and vocational centers can all help current small business owners and employees find the assistance they need. Abdillah strongly believes these efforts in education should help people build digital business ideas and understand how to manage change to complete digital transformation.

Such frameworks ought to maintain both security for consumers and a stable market while also encouraging efforts to improve and invent new technology. Helping businesses test new digital ideas in a supervised way using regulatory sandboxes could protect regulators and guide innovation. If it's easier for small digital businesses to comply, they are less likely to stay hidden from the law. Confident use of the internet will grow when clear and uniform laws for data, privacy, and security are put in place. According to Siregar et al., regulation should be developed by involving MSMEs, so it addresses what they truly need and face.

CONCLUSION

The research analyzed the role of digital innovation in boosting inclusive business models for Indonesian MSMEs and found that there are many opportunities as well as continued difficulties along the path of digital change. The research shows that carefully adopting digital technologies helps MSMEs build business systems that are both sustainable and support the community.

The findings of this research underline a number of aspects of how digital innovation supports the use of inclusive business models in Indonesia. First, going digital helps MSMEs gain access to new markets, operate efficiently, and discover new ways to create value, which boosts their ability to compete and recover from difficulties. Additionally, various digital innovations, for example, e-commerce, digital payment options, solutions based on the cloud, and mobile applications, can guide business model changes in companies based on their situation. In addition, raising successful results most often requires adopting new technology and also reforming the organization, growing capabilities, and shifting positions within the marketplace.

Building inclusive business models brings about many important changes. With digital tools, small businesses can work around past restrictions by lowering costs for transactions, using automation, passing on shared knowledge, and cooperating. As a result of these abilities, MSMEs can create new economic prospects for marginalized people, serve unserved communities by

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making important goods and services available to them, and use more sustainable business methods. Creating these inclusive outcomes requires companies to develop and use their digital business models with inclusion goals as much as with commercial goals.

As a result of this research, policymakers realize that developing infrastructure, strengthening skills, supporting MSMEs financially, and enacting suitable rules will help MSMEs use digital tools. The government should give extra attention to closing the digital gaps between major cities and the countryside, among MSMEs of different sizes, and between established and up-and-coming industries. Doing digital transformation at a larger scale is possible by using public-private partnerships to blend their resources.

Owners and managers of MSMEs are guided by this research to value digital transformation not only for its technology but also as a way to transform their business model. Using modern technology to develop, distribute, and record gains, MSMEs can improve their standing among competitors and still achieve social and environmental goals. Even so, efficiency in digital transformation depends on checking how ready the organization is, teaming digital investments with the organization's goals, and regularly adjusting to new technology and industry trends.

The research indicates that providers and system supporters should craft solutions and services that fit the characteristics, limitations, and requirements of MSMEs. Digital solutions designed with simplicity, affordability, and scalability for MSME business challenges tend to be accepted and make a difference. If support services add technology supply and help with training staff and managing changes, digital projects are more likely to succeed.

The use of secondary data, a low number of case studies, and the fast development of digital technologies and business models are some of the limiting factors of this study. Scientists could improve on these issues by collecting wider data sets, studying digital changes over time, and examining individual digital tools and their influence on business inclusion.

Further studies should pay attention to how specific digital strategies affect MSMEs' income and inclusion, review and compare the patterns of digital transformation in various ASEAN nations, look into future promising trends such as AI and blockchain, and study which policies encourage digital transformation for ASEAN MSMEs. Furthermore, studies on how MSME digitization affects sustainability would help complete what we know about the triple bottom line impacts of digital businesses.

Overall, new digital technologies make it possible for MSMEs to adopt business models that benefit the economy, help people participate, and protect the environment in Indonesia. Yet, making the most of this potential means that various groups need to work together to eliminate persistent problems and share the rewards from digital transformation fairly. If Indonesia helps its MSMEs through a fair and inclusive online economy, it will be able to use its spirit of starting businesses and digital progress to benefit all its citizens.

DECLARATION OF GENERATIVE AI

While preparing this work, the authors used AI tools to improve readability and language. After using these tools, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.

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