

Digital Transformation and AI Literacy for Strengthening MSME Innovation and Sustainability

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Abstract

Digital transformation and the advancement of Artificial Intelligence (AI) technologies have become essential factors in enhancing the competitiveness and sustainability of Micro, Small, and Medium Enterprises (MSMEs). However, many MSMEs in Bekasi Regency continue to face challenges, including low levels of digitalization, limited utilization of AI, inadequate technology-based innovation capacity, and insufficient implementation of sustainable business practices. This community service program aimed to strengthen the capacity of MSMEs through a digital transformation and AI-based mentoring initiative. The implementation method consisted of several stages, including socialization, training, technology adoption, mentoring, evaluation, and sustainability reinforcement. The results demonstrated significant improvements in participants' abilities to utilize digital applications for financial recording, inventory management, and business monitoring. In addition, participants showed increased literacy and practical skills in applying AI for digital marketing, market analysis, and business strategy development. The program also encouraged data-driven product and marketing innovation while raising awareness of efficient and sustainable business practices. Overall, the mentoring activities successfully enhanced the capacity of MSMEs to address digital transformation challenges and established a foundation for more innovative, competitive, and sustainable business development.

Keywords: digital transformation, artificial intelligence, msmes, innovation, business sustainability

Introduction

The partners in this activity are Micro, Small, and Medium Enterprises (MSMEs) in Bekasi Regency engaged in the creative economy and trade sectors. MSMEs have a strategic role in supporting the regional economy, especially as labor absorbers and drivers of the local economy. However, in the midst of accelerating digital transformation and the development of artificial intelligence-based technology, MSMEs still face various challenges in increasing the competitiveness and sustainability of their businesses. Digital transformation not only requires the adoption of technology, but also a change in the business paradigm towards data-based management and innovation (Winarsih, 2025).

Based on the results of field observations, from the operational aspect of the business, most partners are still carrying out business activities conventionally. The financial recording process is carried out manually, so it has the potential to cause recording errors and make it difficult in the financial analysis process. In addition, stock management and distribution have not used an integrated system, which has an impact on low operational efficiency. Business decision-making is also still based on experience alone, not yet using data as a basis for analysis (data-driven decision making). This condition shows that the managerial capacity of partners still needs to be strengthened through the use of digital technology for sustainable development in MSMEs in Bekasi Regency (Bharadwaj et al., 2013).

In terms of digitalization, although some partners have started using technology, the adoption rate is still limited to the use of social media for promotional activities and basic marketplace utilization. The implementation of digitalization has not been integrated into the overall business process, so it has not been able to have a significant impact on improving business performance. This partial digital transformation has caused MSMEs to not be able to optimize the potential of technology in increasing efficiency and competitiveness (Vial, 2019).

Furthermore, the use of artificial intelligence (AI) among partners is still very low. Most MSME actors do not understand the concept and benefits of AI in the business context, and have not utilized various AI-based tools to support digital marketing, consumer behavior analysis, and operational efficiency. In fact, AI technology has great potential in automating business processes, improving the accuracy of market analysis, and driving data-driven product innovation (Davenport & Ronanki, 2018). The limitation of technological literacy is one of the main obstacles in accelerating the digital transformation of MSMEs.

From the innovation aspect, innovative activities carried out by partners are still limited to simple product variations and packaging improvements, and have not led to technology-based and data-based innovation. This shows that the innovation capacity of partners is still low and is not oriented towards sustainable product value-added development. In fact, innovation is a key factor in increasing the competitiveness of MSMEs in the digital economy era (OECD, 2017).

Meanwhile, from the perspective of business sustainability, partners have not fully implemented the principles of sustainable development in their business operations. This can be seen from the lack of data-based production efficiency, low awareness of environmentally friendly business practices, and the lack of a long-term strategy that is integrated with digital transformation. This condition shows that business sustainability has not been part of the main strategy for MSME business development (United Nations, 2015).

Based on this description, it can be concluded that the main problems faced by partners include the low level of digitalization and integration of business systems, the lack of use of artificial intelligence in decision-making, the limited capacity for technology-based innovation, and the lack of optimal application of sustainability principles in business management. Therefore, a structured and technology-based mentoring program is needed to encourage the digital transformation of MSMEs in a comprehensive and sustainable manner. The distinctive contribution of this program lies in the development of an integrated mentoring model that positions digitalization, artificial intelligence, innovation, and sustainability as interconnected stages of MSME business transformation rather than as separate training topics. In this model,

digitalization is used to generate and organize business data, AI is applied to transform the data into practical insights for decision-making, the resulting insights are used to support product and process innovation, and these innovations are directed toward improving operational efficiency and long-term business sustainability.

This integrated mechanism distinguishes the program from conventional MSME assistance, which generally focuses only on digital marketing, marketplace utilization, or general entrepreneurship training. The program does not merely introduce digital applications and AI tools, but assists partners in applying them to actual business processes, including financial recording, stock management, market analysis, content development, operational decision-making, and the formulation of environmentally and economically sustainable business practices. Thus, the program contributes a contextual and applicable transformation framework that connects technological adoption with measurable managerial improvements, innovation capacity, and sustainable business development among MSMEs in Bekasi Regency.

Priority Issues of Partners

Based on the results of the situation analysis, it can be identified that partners face a number of fundamental and interrelated problems, especially in the context of digital transformation and increasing business competitiveness. These problems are then prioritized based on the level of urgency, impact on business performance, and their relevance to the needs of MSME development in the digital economy era.

The first priority problem is the low level of digitalization and the lack of integrated business operational systems. Most partners still carry out conventional business processes, especially in financial record-keeping, stock management, and distribution. This condition leads to low operational efficiency and limitations in accessing real-time information to support decision-making. Digital transformation that is not integrated has been proven to hinder the improvement of organizational performance and business competitiveness (Vial, 2019; Bharadwaj et al., 2013).

The second problem is the lack of literacy and the use of artificial intelligence (AI) in supporting business activities. Partners do not yet understand the potential of AI as a strategic tool in automating business processes, analyzing consumer behavior, and increasing the effectiveness of digital marketing. In fact, the use of AI can provide a competitive advantage through improving the efficiency and quality of data-driven decision-making (Davenport & Ronanki, 2018). These limitations show that there is a gap between technological developments and the adaptive capacity of MSME actors.

The third problem is the low capacity for technology and data-based innovation. Innovations carried out by partners are still incremental, such as product variations and packaging improvements, and have not led to digital-based innovation or data utilization. This condition indicates that MSMEs have not been able to utilize technology as the main enabler in creating added value for products and services. In fact, technology-based innovation is a key factor in increasing competitiveness in the digital economy era (OECD, 2017).

The fourth problem is that the application of business sustainability principles has not been optimal. Partners have not implemented data-driven production efficiency, have limited awareness

of environmentally friendly practices, and have not developed a long-term strategy that is integrated with digital transformation. This shows that the sustainability aspect has not yet become part of business strategic planning, even though the integration between digitalization and sustainability is a demand in modern economic development (United Nations, 2015).

Thus, these four problems are the main focus that needs to be systematically addressed through digital technology-based assistance programs and artificial intelligence, in order to encourage comprehensive operational capacity building, innovation, and business sustainability of partners.



Figure 1. Photos of a Visit to SMEs

Solutions Offered

Based on the priority problems faced by partners, a comprehensive, integrated, and technology-based solution approach is needed to encourage the digital transformation of MSMEs in a sustainable manner. The solutions offered in this program are designed in the form of assistance based on capacity building, the implementation of digital technology, and the strengthening of data-based innovation and artificial intelligence.

The first solution is to strengthen the digitalization of business operations through the implementation of a digital-based business management system. This program will facilitate partners in adopting simple applications for digital financial recordkeeping, stock management, and distribution management in an integrated manner. The implementation of this system aims to improve operational efficiency and support data-driven decision-making. Digitization of business processes has been proven to be able to improve organizational performance through faster and more accurate information integration (Vial, 2019; Bharadwaj et al., 2013).

The second solution is to increase literacy and the use of artificial intelligence (AI) in business activities. This activity is carried out through training and assistance in the use of relevant AI tools, such as for digital marketing content creation, consumer behavior analysis, and marketing strategy optimization. By utilizing AI, partners are expected to be able to increase marketing effectiveness and understand market preferences more accurately. The use of AI in business has been shown to provide a competitive advantage through improved efficiency and quality of decision-making (Davenport & Ronanki, 2018).

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The third solution is to strengthen the capacity for technology and data-based innovation. This program will encourage partners to develop product and service innovations based on market needs. By utilizing digital data. The assistance will be focused on developing value propositions, product differentiation, and utilizing market insights from digital platforms. Technology-based innovation is an important factor in increasing the competitiveness of MSMEs in the digital economy era (OECD, 2017).

The fourth solution is to strengthen the aspect of business sustainability through the integration of efficiency principles and environmentally friendly practices in business operations. Partners will be encouraged to implement data-driven production efficiencies, reduce resource wastage, and start adopting more sustainable business practices. In addition, this program will also assist partners in developing long-term business strategies that are integrated with digital transformation. The integration between digitalization and sustainability is a key element in the development of an inclusive and sustainable modern economy (United Nations, 2015). Overall, the solutions offered focus not only on technology adoption, but also on changing the mindset of MSME actors towards an adaptive, innovative, and data-based business. Through this approach, it is hoped that partners will be able to increase operational efficiency, strengthen competitiveness, and achieve business sustainability in the long term.

Activity Output Targets

The output target of this program is designed comprehensively by referring to the solutions offered, both in terms of production, business management, and empowerment of communities that are not economically productive. These outputs are not only oriented towards short-term output, but also on sustainable medium- and long-term outcomes.

In terms of production, the implementation of appropriate technology and the digitalization of production processes are expected to be able to increase the capacity and efficiency of partners' businesses. This increase is characterized by an increase in production volume, operational cost efficiency, and improved product quality through product standardization and innovation. Product diversification is also one of the important outputs, so that partners do not only depend on one type of product, but are able to adapt to dynamic market needs. This is in line with the findings that technology adoption and product innovation contribute significantly to increasing the productivity and competitiveness of MSMEs (OECD, 2018; Brynjolfsson & McAfee, 2014).

Furthermore, in the aspect of business management, the expected output is an increase in the capacity of partners in managing the business professionally, especially in terms of financial recording, business planning, and data-based decision-making. The implementation of a simple digital-based financial system is expected to increase business transparency and accountability, as well as assist partners in managing cash flow more effectively. In addition, increasing entrepreneurial literacy is a key factor in encouraging business sustainability, as stated that strengthening managerial capacity has a positive influence on the performance of small and medium enterprises (Rauch & Frese, 2007).

In terms of marketing, the use of digital platforms such as social media and e-commerce is a strategic solution to expand market reach. Output targets in this aspect include increasing the number of customers, expanding market access, and increasing sales turnover. Marketing

digitalization also allows partners to be more adaptive to changes in consumer behavior in the digital economy era. Previous studies have shown that digital transformation in marketing is able to significantly improve sales performance and business competitiveness (Davenport, 2006).

For community groups that are not economically productive, program outputs are focused on improving skills and forming new business units. Through skills training and entrepreneurship assistance, the community is expected to be able to produce products or services with economic value. In addition, this program also targets a change in mindset from dependence to economic independence. Community empowerment through individual capacity building has been proven effective in increasing economic participation and community welfare (Alim et al., 2022).

Overall, the output of this program also includes the preparation of an innovation and technology based empowerment model that can be replicated, as well as scientific publications as a form of dissemination of the results of activities. Thus, this program not only provides direct benefits to partners, but also contributes to the development of evidence-based community development science and practices.

Method

The implementation of the community service program is designed through structured stages to ensure that the solutions offered are able to answer partner problems effectively and sustainably. This stage includes socialization, training, technology application, mentoring and evaluation, and program sustainability.

The initial stage is socialization, which aims to build a common understanding between the implementation team and partners regarding the objectives, benefits, and mechanisms of activities. This activity is carried out through discussion forums, presentations, and initial coordination to identify the specific needs of partners and align the expectations of both parties. Effective socialization has been proven to increase active participation of partners and is an important foundation in program success (Nuryana et al., 2025).

Furthermore, the training stage is focused on increasing the capacity of human resources of partners, especially in managerial, entrepreneurship, and the use of digital technology. The training method is carried out in a participatory manner through workshops, simulations, and hands-on practice so that participants not only understand the concept, but also be able to apply it in business activities. Need-based training is considered more effective in increasing the competence and productivity of partners (Barima, 2025).

The next stage is the application of technology, which is at the core of the solutions offered. At this stage, partners begin to implement the technologies that have been introduced, such as the use of digital platforms, application-based business management systems, or more efficient production tools. This process is carried out in stages by considering the readiness of partners so that technology adoption can run optimally. Digital transformation in MSMEs has been proven to be able to increase operational efficiency and business competitiveness (Priyanto et al., 2025).

The mentoring and evaluation stage is carried out on an ongoing basis to ensure that the implementation of the solution runs as planned. The implementation team provides technical guidance, monitoring, and evaluates program achievements using measurable indicators.

Evaluations are carried out periodically to identify obstacles faced by partners and formulate necessary improvements. Intensive mentoring has been shown to contribute significantly to the successful adoption of innovations by partners (Rumfot et al., 2025).

The final stage is program sustainability, which aims to ensure that the benefits of the program continue to be felt by partners after the service activities are completed. The sustainability strategy is carried out through institutional strengthening, business network development, and increasing the independence of partners in managing their businesses. In addition, a comprehensive knowledge transfer is also carried out so that partners are able to develop innovations independently in the future. The sustainability of the program is an important indicator in assessing the long-term impact of service activities. With this systematic and integrated stage, it is hoped that the solutions offered will not only solve short-term problems, but also be able to increase the capacity and independence of partners in a sustainable manner.

Results and Discussion

Implementation of Mentoring Activities

Community service programs have been implemented for MSME actors in the creative economy and trade sectors in Bekasi Regency through the stages of socialization, training, implementation of digital technology, mentoring, and evaluation. The activity was attended by MSME actors who had previously been identified as having limitations in the use of digital technology, artificial intelligence (AI), data-based innovation, and the application of business sustainability principles.

At the socialization stage, participants showed high enthusiasm for digital transformation materials and the use of AI in business development. The results of the initial discussion showed that most participants were aware of the importance of digitalization, but still experienced obstacles in the implementation of technology in daily business activities.

Increasing the Digitalization of Business Operations

The results of the activity show an increase in the ability of partners to use digital applications for financial recording, stock management, and business transaction monitoring. Before the activity was carried out, most partners still used manual recording so that the business data management process was less effective. After the mentoring, partners began to implement simple digital applications that allow transaction recording to be done more systematically and accurately. The implementation of digital systems has a positive impact on operational efficiency. Partners can access financial and stock data in real-time, making the decision-making process faster. These findings are in line with research that states that the digitization of business processes is able to improve operational efficiency, information quality, and overall business performance.

Increasing Literacy and Utilization of Artificial Intelligence (AI)

One of the important achievements of this activity is the increasing understanding of participants about the concept and use of AI in business. Before the training, most of the participants only knew AI as a technology used by large companies and did not understand its

benefits for MSMEs. Through hands-on training and practice, participants are introduced to various AI tools that can be used to create marketing content, prepare product descriptions, conduct simple market analysis, and help prepare digital promotion strategies. The results of the evaluation showed that participants were able to use AI to produce promotional content that was more engaging and efficient than manual methods. The use of AI provides benefits in the form of saving time, increasing marketing creativity, and the ability to better understand consumer needs. This condition shows that AI can be a technology that is easy for MSMEs to adopt if supported by the right training and mentoring.

Strengthening the Capacity of Technology-Based Innovation

Mentoring activities have also succeeded in increasing the innovation capacity of partners. Before the program was implemented, the innovations carried out were still limited to packaging changes and simple product variations. After receiving training on data-driven innovation and market needs analysis, participants began to develop product ideas based on consumer preferences obtained from digital platforms. Some partners have begun to diversify their products and improve their branding and digital marketing strategies. The resulting innovations not only focus on products, but also include service processes and communication strategies with customers. These results show that the use of digital technology can be the main driver of the emergence of more market-oriented innovations.

Implementation of Business Sustainability Principles

In the aspect of sustainability, the activity succeeded in increasing participants' awareness of the importance of efficient and environmentally friendly business practices. Partners are beginning to understand the relationship between digitalization, resource use efficiency, and business sustainability. Some of the changes that have begun to be implemented include reducing the use of paper through digital recording, more efficient inventory management to reduce waste, and the use of digital marketing media that is more cost-effective than conventional promotion. In addition, participants also began to develop long-term business development plans that consider economic, social, and environmental aspects. The application of this sustainability principle is the first step in building a business model that is more adaptive to changes in the modern business environment. The integration between digitalization and sustainability is believed to increase business resilience and create sustainable added value for MSMEs.

Program Impact Evaluation

Based on the results of monitoring and evaluation, the program has a positive impact on increasing partner capacity. These impacts include:

1. Increasing the ability to use digital technology in business management.
2. Increasing literacy and skills in the use of AI to support business activities.
3. Increasing product innovation capabilities and data-driven marketing.
4. Increased awareness of the importance of sustainable business practices.
5. Increasing the readiness of MSMEs in facing competition in the digital economy era.

These results show that a mentoring approach that integrates digitalization, artificial intelligence, innovation, and sustainability is able to provide relevant solutions to the problems faced by MSMEs in Bekasi Regency. The program not only improves participants' technical skills, but also encourages a change in mindset towards more modern, adaptive, and data-driven business management.

Conclusion

The findings of this activity show that the low level of technology adoption among MSMEs is not solely due to limited access to technology, but also to low digital literacy and lack of continuous assistance. Therefore, training accompanied by direct practice and intensive mentoring is an important factor in increasing the success of MSME digital transformation. In addition, the use of AI has proven to be a relatively easy solution for MSMEs to implement because it does not require a large investment. AI can help businesses improve productivity, marketing effectiveness, and decision-making quality. These findings strengthen various studies that state that AI is a strategic technology in supporting the competitiveness of MSMEs in the digital economy era.

From a sustainability perspective, the integration between digitalization and operational efficiency shows that digital transformation not only impacts increased business profits, but also supports more sustainable business practices. Thus, the development of MSMEs in the future needs to be directed at a business model that combines digital technology, data-based innovation, and sustainable development principles simultaneously. Overall, this mentoring program has succeeded in increasing the capacity of MSMEs in Bekasi Regency in facing digital transformation challenges and building the foundation towards a more innovative, competitive, and sustainable business.

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