

Micro, Small, and Medium-Sized Enterprises (MSMEs) Sustainability: The Strategic Role of Digitalization, Financial Literacy, and Technological Infrastructure

Muthia Harnida¹, Asokan Vasudevan², Siti Mardah³, Ilisa Fajriyati⁴, Prihatini Ade Mayvita⁵, Mohammad Faleh Ahmmad Hunitie⁶, Suleiman Ibrahim Shelash Mohammad⁷

Abstract

The topic of micro, small, and medium-sized enterprises has always been interesting to discuss. MSMEs contribute to the Indonesian economy but also encounter various challenges in their business operations due to the fast growth in economic development. The sustainability of micro, small, and medium-sized enterprises becomes the priority for the policymaker. Thus, to understand their problems, it is necessary to make the appropriate policy. The shifting of businesses operating in the competitive era of digitalization brings the consequences to micro, small, and medium-sized enterprises to adapt to the changes by adopting digitalization and understanding the financial literacy, and technological infrastructure to support their operation in this era. Some previous studies have found that the three factors positively and significantly influence the sustainability of MSMEs. This study takes a closer look by combining these three variables in one model to explore the impact of digitalization, financial literacy, and technological infrastructure on the sustainability of MSMEs. Data was collected from 83 owners of MSMEs in Banjarmasin, Indonesia, through an online questionnaire and analyzed using multiple linear regression. The result showing the negative effect of digitalization contradicts several previous studies that found a positive impact instead. The positive effect of financial literacy and technological infrastructure on the sustainability of MSMEs is still consistent with prior research. This research contributes to the academic insight into the importance of digitalization, financial literacy, and technological infrastructure for the sustainability of MSMEs and valuable practical recommendations to policymakers to support the sustainability of MSMEs. Further implications of these findings are discussed.

Keywords: *Micro, Small, And Medium-Sized Enterprises, Digitalization, Financial Literacy, Technological Infrastructure.*

Introduction

Micro, small, and medium-sized enterprises have contributed to the Gross Domestic Product (GDP) by more than 60 percent (Dpjb.kemenkeu.go.id). MSMEs serve as a means of equalizing the economic level of the lower classes, eradicating poverty, and generating foreign exchange for the country (Sulastri, 2022). MSMEs have great potential to improve people's welfare. The Ministry of Communication and Information's release explains the role of MSMEs in providing employment and the absorption of the workforce in Indonesia, which reaches 97% of the total workforce, or around 119.6 million people (Kominfo.go.id, 2022). The Ministry of Communication and Information of the Indonesian government launched the program MSMEs Go Online in 2020. The government targets 30 million MSMEs in Indonesia to join the program by 2024. However, this target has not yet been fulfilled until the first half of 2024 (Kominfo, 2024). However, only about 17.5 million MSME players have entered the digital ecosystem and utilized e-commerce (Kominfo.go.id, 2022). There are about 37.214 MSMEs in Banjarmasin operating in various sectors, according to data for 2022 (Dinas Koperasi dan UMKM, 2022). Until now, these MSMEs

¹ Universitas Islam Kalimantan (UNISKA) Muhammad Arsyad Al Banjari Banjarmasin, Indonesia, Email: muthiaharnida@gmail.com, Orcid id: <https://orcid.org/0009-0009-2984-8607>

² Faculty of Business and Communications, INTI International University, Persiaran Perdana BBN Putra Nilai, 71800 Nilai, Negeri Sembilan, Malaysia, Research Fellow, Wekerle Business School, Budapest, Jázmin u. 10, 1083 Hungary, Email: asokan.vasudevan@newinti.edu.my Orcid: <https://orcid.org/0000-0002-9866-4045>

³ Universitas Islam Kalimantan (UNISKA) Muhammad Arsyad Al Banjari Banjarmasin, Indonesia, Email: sitimardah27@g-mail.com

⁴ Universitas Islam Kalimantan (UNISKA) Muhammad Arsyad Al Banjari Banjarmasin, Indonesia, Email: ilisa.fajriyati@uniska-bjm.ac.id, Orcid id: <https://orcid.org/0000-0003-1531-4857>

⁵ Universitas Islam Kalimantan (UNISKA) Muhammad Arsyad Al Banjari Banjarmasin, Indonesia, Email: ademayvita@gmail.com

⁶ Universitas Islam Kalimantan (UNISKA) Muhammad Arsyad Al Banjari Banjarmasin, Indonesia, Email: Mhunitie57@gmail.com

⁷ Electronic Marketing and Social Media, Economic and Administrative Sciences Zarqa University, Jordan; Research follower, INTI International University, 71800 Negeri Sembilan, Malaysia. E-mail - dr_sliman@yahoo.com ORCID: (0000-0001-6156-9063)

still face many challenges in operating their businesses, such as financing from financial institutions, limited the broader market, limited human resources and capital, and limited skill. They also encounter obstacles due to high competition and globalization. To overcome these challenges, the government needs to take a role in promoting MSMEs' development and sustainability using their role in implementing the right policies and making.

The business's trend of changing operations from traditional to highly digital makes MSMEs need to survive with optimal strategy. And the need for digitalization is a must. The adoption of digital technologies is an essential factor for SMEs' efficiency and productivity. Digitalization is one of the strategies used to help SMEs' sustainability (Op.europa.eu, 2021). Surveys in SMEs across several developing countries demonstrate that digitalization is the factor that contributes to the resilience of SMEs in times of crisis like the pandemic (Khalil et al., 2022). Besides digitalization, financial literacy is also important to the sustainability of MSMEs. With financial literacy, MSMEs can manage their financial matters better. This will support the sustainability of MSMEs and adaptation to changing business paradigms (Ojk.go.id, n.d.). Good financial literacy will give MSMEs knowledge on budgeting strategies and investment choices and open their access to formal financial institutions. With this knowledge, MSMEs will make better financial decisions and prevent MSMEs from fraud. In this way, MSMEs will be more resilient in dealing with uncertain economic conditions (Lusardi & Mitchell, 2017; Mohammad et al., 2024a; Mohammad et al., 2024b; Mohammad et al., 2024c; Musthafa et al., 2023).

Digitalization and financial literacy are essential for MSMEs' business processes. Both aspects will help MSMEs adapt to business uncertainties and contribute to the country's ecosystem, avoiding negative impacts. MSMEs with no adequate infrastructure, such as bad networks and devices, will face many forms of limitations in technology adoption. Conversely, MSMEs with proper technological infrastructure will be able to have more efficient business processes and operations and will also be able to increase their business competitiveness. Technological infrastructure will also expand their business, reach a wider market, and enhance their sales (Hendrawan et al., 2024; Al-Fakeh et al., 2023). By combining digitalization, support of financial infrastructure, and good financial literacy, MSMEs are expected to increase their efficiency, adaptation to global trends, and competitiveness. This quality will eventually lead MSMEs to better sustainability.

Wang et al. (2023) found that higher digital capabilities and integration positively affect the performance of enterprises. Innovation in the digital process was found to contribute to the efficiency of enterprises and add to financial return (Foster & Heeks, 2018). Other studies found similar results and suggest that digitalization in marketing and other business processes will contribute to business sustainability (Hilmi & Marjulin, 2019; Al-Adamat et al., 2023; Mohammad et al., 2023a; Mohammad et al., 2023b; Vrontis et al., 2022). Susan (2020), in her study, demonstrated that financial literacy promotes the growth of MSMEs. Ye & Kulathunga's (2019) study, conducted in another developing country, also found a similar result. The results show that financial literacy directly affects SMEs' sustainability. Higher financial literacy can become intellectual capital to promote sustainability and enhance SMEs' capability to deal with rapidly changing economic conditions. Technological infrastructure refers to technological resources and facilities to support operations and business activities. In this case, it is also essential. Some research has proved the role of infrastructure technology in the sustainability of MSMEs. Technological infrastructure also makes MSMEs more efficient and innovative and then helps the enterprise's growth (Australian Small Business and Family Enterprise Ombudsman, 2020).

To analyze the role of digitalization, financial literacy, and technological infrastructure, we examine these variables in one model to know the effect of those variables on the sustainability of MSMEs using the owners of MSMEs operating in Banjarmasin as respondents. Banjarmasin is one of the cities in Indonesia that also contributes to local economic development, with a total of MSMEs of around 37.214 according to data from 2022. The research finding is expected to provide a more comprehensive understanding of the factors supporting the sustainability of MSMEs and guide government institutions, specifically the policy for local government and related institutions to support MSMEs.

Literature Review

Technology Acceptance Model (TAM)

The *Technology Acceptance Model* (TAM) is a theory that explains human behavior when adopting and accepting new technology. This model is usually used to picture and understand the factors that affect users in accepting new technology. There are four constructs in the model, namely perceived usefulness, which can be interpreted as the benefits felt, perceived ease of use, which is interpreted as the ease felt, attitude toward using, which is interpreted as attitude towards using, and actual usage, which can be interpreted as using it in real conditions. With perceived ease of use, MSMEs tend to accept digital technology if they consider it easy to use and give the benefit (Alkhaldeh et al., 2023; Davis, 1989).

Digitalization

Digitalization refers to digital tools, platforms, and processes in a business, organization, or industry to become more efficient and innovative. Digitalization serves MSMEs in many ways. Digitalization will improve operational efficiency. Technology enables MSMEs to manage their inventory, sales, and finances efficiently. The use of online platforms helps MSMEs reach a wider market. This approach increases consumer accessibility and opens up new opportunities for sales and business growth. Next, digitalization also helps

MSMEs make better decisions and better analyses by utilizing digitally obtained data. Thus, MSMEs will understand customer behavior, market trends, and business performance, allowing them to adjust their strategies more effectively. Digitalization can also increase the competitiveness of MSMEs when they adopt a suitable technology.

Financial Literacy

Financial literacy is a process and activity of the knowledge, confidence, and skills of the wider community to manage their finances (Aldaihani et al., 2023; Otoritas Jasa Keuangan (OJK), 2021). Hasibuan et al. (2022) describe financial literacy as knowledge and skills to manage finance. Financial literacy refers to three important aspects. They are knowledge, skills, and confidence. The knowledge aspect is about understanding information about financial institutions, risks, rights, and obligations of consumers. The skill aspect is about the ability to operate risk calculation, interest, etc. The confidence aspect refers to the trust in money channeled to trusted financial institutions with various instrument options and existing conditions.

The Financial Services Authority (OJK) divides financial literacy levels into 4 types. Namely, well-literate, sufficient-literate, less-literate, and not literate. The financial literacy level of the well-literate indicates that the individuals or organizations have sufficient knowledge of finances, including the products and services. They also already have trust in financial service institutions. Other than that, they already have adequate skills in using existing financial products for their benefit. The second category, sufficient literate, describes the level of knowledge and confidence of individuals and organizations of existing financial service products. The third category is less literate. Individuals or organizations in this category only know about the financial institutions, products, and services but do not know how to manage and use those facilities. The last category is the not literate category. Individuals or organizations at this level have insufficient knowledge about financial products and services.

Technological Infrastructure

Technological infrastructure refers to technological resources and facilities to support operations and business activities. It includes software, hardware, networks, and information systems that contribute to efficiency and effectiveness in daily activities. The availability of technological infrastructure for MSMEs helps facilitate business processes more efficiently and reduces manual work. Technology infrastructure enables MSMEs to connect with global markets through e-commerce platforms, increasing sales

opportunities and international market penetration. With a good information system, MSMEs can analyze customer data, market trends, and business performance, helping make better decisions. Besides, technological infrastructure provides information on security solutions that protect customer data, transactions, and business information from security threats.

MSMEs Sustainability

The issue of sustainability has become a matter related to maintaining the environment and its consequences to the business environment together by implementing aspects of sustainability such as economic, environmental, and social dimensions. The theory of sustainability contains the capacity to maintain natural resources and the availability of materials in the long term to obtain favorable conditions (Mathis & Harrington 2017). In MSMEs' cases, sustainability can be understood as the MSMEs' ability to survive in the long term and positively influence or bring no harm to the environment and society.

The economic dimension refers to the ability of MSMEs to create economic value, adjust to market development, and manage finances wisely. The environmental dimension is related to the practice of protecting the environment. MSMEs must understand how to reduce the negative impact of their business operations. The social dimension refers to social contribution, human development, and the fair practice of employment policy. The sustainability of MSMEs must focus on economic aspects such as profitability, sales, and the awareness of keeping the balance among economic, social, and environmental.

Hypothesis Development

Digitalization and the Sustainability of Msmes

Digitalization opens up the space for MSME players to increase their operating business. The digitalization forces business players, including MSMEs, to utilize it. A literature review on the role of digitalization in achieving sustainability explains that digital transformation has an important role in the sustainability of MSMEs. Digital transformation will optimize processes within the business, starting from data analysis, business management, and communication. Generally, digitalization improves flexibility, innovation, and financial performance, contributing to economic, social, and environmental sustainability (Al-Husban et al., 2023; Martínez-Peláez, 2023). Gao et al. (2023) demonstrated that MSMEs' adoption of e-commerce has a positive and significant impact on the financial performance and sustainability of MSMEs even in a situation of crisis.

Research conducted by Budiarto et al. (2023) also revealed that digital adaptation in MSMEs induces higher sustainability and eventually leads to better market performance. Another method of digitalization is the use of cloud computing technology. It enhances the flexibility of business operations (Alshura et al., 2023; Gui et al., 2021). It is the same with digitalization in marketing and other modern digital technologies. Hilmi and Marjulin (2019) found that digital marketing enhances the profits of MSMEs. Vrontis et al. (2022) found that the benefits of modern technology such as social media, blockchain, IoT, AI-enabled applications, and big data analytics in SMEs contributed to economic development, social value, and enhanced performance.

The sustainability of MSMEs in the future can be explained by digitalization, which can help their operating business. The higher digitalization implemented higher benefits, which brings the sustainability of MSMEs. MSMEs will exist when they own more capital and capability. By considering the importance of digitalization to promote the ability of MSMEs to increase market competition to be more sustainable, the hypothesis that can be developed is as follows:

H1: Digitalization positively and significantly influences the sustainability of MSMEs.

Financial Literacy and the Sustainability of MSMEs

Financial literacy refers to a comprehensive knowledge of understanding the financial. MSMEs, as business players, must own the knowledge of matters related to finance to conduct their operations efficiently and effectively. Some research has been evidence of the effect of financial literacy on the sustainability of MSMEs. Research by Rumini and Martadiani (2020) found a positive influence on sustainability. Pramaswara and Athoillah (2023) also found an effect of financial inclusion on the development of MSMEs.

The benefit of financial literacy is that it provides the ability to manage good finances, such as cash flow, funding, investment, etc., and makes MSMEs wiser in using finances and avoiding fraud, such as investment schemes such as fake investments, illegal loans, Ponzi schemes, etc. Djuwita & Yusuf (2018) found that MSMEs that utilize the opportunities to conduct business operations with more efficient productivity will get higher profits. Financial literacy affects the sustainability of MSMEs. Therefore, the hypothesis is as follows:

H2: Financial literacy positively and significantly influences the sustainability of MSMEs.

Technological Infrastructure and the Sustainability of MSMEs

MSMEs need supporting devices, such as hardware and software. Technological infrastructure will enable MSMEs to support their business operations. The adoption of digitalization needs technological infrastructure to facilitate it. The study underscores the vital role of technological advancement in SMEs for their sustainability and competitiveness in the global market. Ghobakhloo et al. (2022) found that technological infrastructure affects the adoption of Industry 4.0 in manufacturing SMEs and environmental factors but still requires knowledge competencies and value chain digitalization readiness for success. Prasanna et al. (2019) found that the effect of technological adaptation brings successful SME performance in the competitive market. Therefore, the hypotheses are developed as follows: H3: Technological infrastructure positively and significantly influences the sustainability of MSMEs.

Research Methods

Sample Criterion and Sample Collection Method

The research sample was taken from MSMEs in Banjarmasin City with criteria based on the Government Regulation of Ministry Cooperative and MSMEs Number 7 of 2021 (PP UMKM No. 7, 2021). For established MSMEs, the type or grouping of MSMEs is based on the criteria of annual sales results. These include microbusinesses with maximum annual sales of IDR 2 billion. Small businesses have annual sales of more than IDR 2 billion, a maximum of up to IDR 15 billion. Medium: have business capital between IDR 5 billion, and IDR 10 billion.

Data was collected through a questionnaire online via Google Forms, and data was obtained from 83 respondents who fulfilled the criteria MSMEs according to PP UMKM No.7, 2021.

Variables and Operational Definition

The dependent variable is the sustainability of MSMEs, which is measured by

indicators of profitability, operational efficiency, financial management, increase in market share, diversification of products and services, legal compliance, and business ethics. The independent variables are digitalization (X_1) measured by the indicators of access to technology, digital marketing and promotion, digital transactions and payments, inventory and production management, and digital security. Financial literacy (X_2) is measured by cash and expenditure management, understanding of taxes, and involvement in financial planning. The measurement of technological infrastructure (X_3) is the availability of hardware, software, internet connection, information security and data protection, training and technical support, e-commerce, and online presence. The measurement scale used is a Likert scale (1–5).

Data Analysis Method

Multiple linear regression of the data is used to analyze with the following equation: Y

$$= a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \dots$$

Information:

Y= The sustainability of MSMEs

X1= Digitalization

X2 = Financial Literacy

X3 = Technological Infrastructure a =
constant

$\beta_1 - \beta_3$ = regression coefficient e=
Standard error

*Result and Discussion***Result**

The demographic of respondents is from Table 1 to Table 5. The demographic profile includes gender, age, level of education, year of experience in operating the business, and type of business.

Table 1. Gender of Respondents

No	Gender	Frequency	Percentage (%)
1	Male	28	33,70%
2	Female	55	66,30%
	Total	45	100%

Table 2. Age of Respondents

No	Age	Frequency	Percentage (%)
1.	17 - 25	22	26.51%
2.	26 - 35	28	33,70%
3.	36 - 45	19	22.90%
4.	46 - 55	5	6%
5.	56 - 65	9	10,8%
6.	> 65	0	0

Table 3. Level of Education

No	Graduates	Frequency	Percentage (%)
1.		1	1,2%
2.		39 28	47%
3.	Junior School	12	33,7%
4.	High School	2	14,5%
5.	Bachelor Master Degree Doctorate		2,4%

Table 4. Experience in Operating Business

No	year	Frequency	Percentage (%)
	< 1	18	21.7%
1.	1 - 5	36	43.4%
2.	5 - 10	15	18.1%
3.	10 - 15	6	7.2%
4.	> 15	8	9.6%

Table 5. Scale of Business

No	year	Frequency	Percentage (%)
1	Micro	19 46	22.9%
2	Small	18	55.4%
3	Medium		21.7

The results of the reliability test are in the following table. The reliability of Cronbach's alpha coefficient is > 0.60 .

Table 6. Reliability Test

No	Variable	Cronbach's Alpa
1	MSMEs 'sustainability	0.907
2	Digitalization	0.908
3	Financial Literacy	0.930
4	Technological Infrastructure	0.890

Reliability test results show that The sustainability of MSMEs has a Cronbach's alpha of 0.907, the Cronbach's alpha of Digitalization is 0.908, and the Cronbach's alpha of Financial Literacy is 0.930. The Cronbach's alpha of technology Infrastructure is 0.890. All instruments in this study have Cronbach's alpha above 0.8. The normality test shows that the data is normally distributed ($p > 0.05$). The multicollinearity test result found that Digitalization has a tolerance value of 0.486 (≥ 0.1) and VIF value of 2.060 ($VIF \leq 10$), Financial Literacy has a tolerance value of 0.725 (≥ 0.1) and VIF value of 1.379 ($VIF \leq 10$), and Technological Infrastructure has a tolerance value of 0.439 (≥ 0.1) and VIF value of 2.279 ($VIF \leq 10$).

Therefore, no multicollinearity was found among the independent variables.

The results of the hypothesis analysis are summarized in Tables 7 and 8.

Table 7. Model Summary

R2	Adjusted R ²	F-statistic	p-value (Anova)	Durbin-Watson
.513	.495	27.424	.000	1.606

Table 8. Regression Result Analysis

	Unstandardized B	Coefficients Std. Error	t	P-Value
Constant	18.813	3.400	5.533	.000
Digitalization (X1)	-.365	.120	-3.050	.003
Financial Literacy (X2)	.339	.077	4.379	.000
Technological Infrastructure (X3)	.634	.122	5.214	.000

Dependent Variable: Msmes Sustainability

The regression analysis shows an F-statistic value of 27.424 and a p-value < 0.05 indicates that the overall model is statistically significant. The adjusted R² of 0.495, means that 49.5% of the variation in The sustainability of MSMEs can be explained by digitalization, financial literacy, and technological infrastructure while remaining determined by other variables outside of this model. Multiple regression analysis also shows that the impact of digitalization on MSMEs sustainability has a negative significance in the local context of Banjarmasin ($\beta = -0.365$, t-value -3050, and p-value = 0.003). The robustness of this finding is proven by examining the residuals statistics which indicate an acceptable range, and normal distribution, with a mean of 0.000 and standardized residuals range between -2.143 and 2.256. It suggests that the negative impact of digitalization is a genuine reflection of the data, not an artifact of model misfits or outliers. This finding revealed that higher levels of digitalization are associated with the sustainability of MSMEs which decreases. Financial.

Literacy (X2) has a positive and significant impact on the sustainability of MSMEs ($B = 0.339$, $p = 0.000$), while technological infrastructure (X3) has a positive and important effect on this ($B = 0.634$, $p = 0.000$).

Discussion

The outcome of this study shows that financial literacy and technological infrastructure positively and significantly influence the sustainability of MSMEs, while digitalization has a negative significant impact. Therefore, the second and third hypotheses can be accepted. However, the result of the first hypothesis contradicts several previous studies that found positive effects on The sustainability of MSMEs. The impact of financial literacy and The sustainability of MSMEs indicates that higher financial literacy will increase sustainability or vice versa. This result aligns with research conducted by Rahayu & Musdholifah (2017) which found that the outcome of financial literacy has a positive and significant effect on MSMEs' performance and sustainability. A good financial literacy enables MSMEs to manage financial risks, cash flow, growth, and business. Based on this finding, MSMEs have to focus on better financial management. The policymaker should also pay more attention to giving training to enhance the skills and knowledge of MSMEs to operate their businesses better.

Technological infrastructure also has a positive and significant effect on the sustainability of MSMEs. MSMEs should be supported by technological infrastructure to increase and support their operating business. This result is aligned with the previous study by Ghobakhloo, et al. (2022), which also found a similar result. Pichagonakesit, et al. (2023) in Thailand also found a significant positive impact of manufacturing's technological infrastructure on small and medium enterprises' sustainability.

However, the outcome of digitalization on the sustainability of MSMEs found a negative effect. This empirical evidence is contrary to the assumption that digitalization will support sustainability because it is found to have a detrimental impact on the sustainability of MSMEs. This finding is inconsistent with the results of several previous studies that suggest how digitalization impacts the sustainability of MSMEs with a positive impact. (Martínez-Peláez, 2023). An empirical study by Wang et al. (2023) also showed that higher digital capabilities and integration positively affect the performance of enterprises. The unique finding that digitalization decreases SMSEs' sustainability in this study can be explained by the fact that the ability to use digital technologies may cause more challenges than benefits under certain conditions. This significant negative effect of digitalization on the sustainability of MSMEs in Banjarmasin can be explained by the expensive implementation costs of the adoption of digitalization, lack of digital literacy, or improper use of digital tools. As a result, the MSMEs are burdened by the use of digitalization.

The negative relationship between digitalization and the sustainability of MSMEs may be explained from the perspective of women respondents. In this research, the respondents of the owners of MSMEs are more women than men. This finding can be explained by connecting with the study conducted by Gefen & Straub (1997) that examined whether there was a different perception between women and men on the perception of technology using a technology acceptance model (TAM). The result found that women tended to accept the technology when they felt the higher benefit of that technology. The perceived usefulness was higher in women than in men. However, perceived ease of use in men is higher than in women. Thus, there was a different perception between women and men in technology acceptance. It indicates that women are more pleased with the use of technology, and men are more adept at using technology. The study that also examined the differences in the adoption of technology between women and men in technology adoption is the study by Venkatesh et al. (2000). The study concluded that women were more influenced by social pressure and had better control of their behavioral outcomes. They are more cautious and avoid risks when adopting new technologies.

The negative effect of digitalization on the sustainability of MSMEs can also be explained by the respondents, who were represented more by the players of MSMEs with short years of experience. The business experience of respondents in this study operating businesses is predominantly less than 1 year (21.7%) and 1–5 years (43.7%). Short business experience, such as those with less than 1 year and 1–5 years experience, may still face a lack of capital, human resources availability, competitiveness, and skill experience. They may also have limited market access. Enterprises with short business experience may also lack an understanding of sustainability, which implies their limited influence on the environment and social aspects of sustainability. Digitalization generally impacts business processes positively. However, for

MSMEs with limited resources, digitalization could lead to higher costs and eventually cause ineffectivity in business operations. This limitation may explain why digitalization hurts sustainability instead of benefiting business effectiveness. Considering this potential determining factor of sustainability, the digitalization agenda needs to be accompanied by digital literacy improvement, resource fulfillment, and the availability of robust technological infrastructure.

This research finding cannot prove that technology adoption or digitalization improves the sustainability of MSMEs in Banjarmasin. On the contrary, the adoption of digitalization reduces the sustainability of MSMEs. This finding provides the government with new insight regarding ways to manage technology adoption in MSMEs. The roles of government and other related parties are needed to provide training, capital, and a supporting system for MSMEs to increase the literacy of digitalization and the ability to use digitalization in the operation of their business to prevent the downside of digitalization on the sustainability of MSMEs, especially in Banjarmasin.

The implementation of digital technology and the demands of rapid change from digitalization can make business players focus too much on efficiency and profitability so that important aspects such as social responsibility and environmental sustainability are neglected. Ignoring these aspects can be detrimental in the long term, both for the surrounding community and the business itself when the business continues to grow in the future. MSMEs that integrate sustainability into their digital strategy will be able to build stronger relationships with customers and create more durable and ethical business models under current market demands that increasingly prioritize the aspect of sustainability. In this matter, the government has an important role in encouraging MSMEs to pursue profits through digitalization and ensuring that MSMEs' business practices are aligned with sustainability principles. To align the adoption of digitalization with the sustainability of MSMEs A comprehensive understanding of the sustainability dimension must be socialized among MSMEs, thus raising awareness to balance all dimensions of sustainability in business practice.

Conclusion and Implication

This study reveals that financial literacy and technological infrastructure positively and significantly influence the sustainability of micro, small, and medium-sized enterprises in Banjarmasin City. However, digitalization has a significant negative effect. This result contradicts several previous studies that generally reveal the positive impact of digitalization on business performance. This finding indicates that adopting digital technology varies in implementation and benefits to MSMEs in enhancing their businesses. The contextual factors such as technological readiness, management capacity, and adaptability of MSMEs players must be considered when adopting digitalization for MSMEs in line with their capacity. The inability of MSME players to keep balancing technological changes, the high costs of technology, or a lack of knowledge to benefit digital tools, ignoring the environmental and social aspects, may contribute to these results. These results explain that implementing digitalization is not always in line with the increasing MSMEs 'sustainability. Several reasons that can explain this finding are the majority of women respondents who participated in this research, of which there are differences between women and men in accepting technology, the experience of operating businesses of the respondents dominated by less than 1-year (21.7%) experience, and 1–5 years of experience. This condition may explain this finding. Maybe they still face adjustment, limitations, and other conditions such as lack of capital, lack of human resources, lack of skills, inefficiency in operation, and lack of understanding of the sustainability concept in business operation. Yet, the negative impact of digitalization identified in this study needs further investigation.

Financial literacy and technological infrastructure consistently give the same results as the previous research. The consistent findings on the positive impact of financial literacy and technological infrastructure highlight their strategic roles in supporting the sustainability of MSMEs. Enhanced financial literacy enables MSMEs to manage cash flow and financial risks more effectively, while robust technological infrastructure benefits operational efficiency and innovation.

These findings are useful for understanding the importance of integrating policy, which can support the ability of MSMEs to adapt to digitalization by understanding their condition in the real world. The strategic role of digitalization, financial literacy, and technological infrastructure in the sustainability of MSMEs has to consider the protection of environmental aspects.

This research's limitations include the small sample size and the use of only three independent variables. To obtain consistent results, future research should include more respondents. Future research can incorporate control variables, such as business scale, specific industry, or geographic factor, to ensure the effect of those variables on the sustainability of MSMEs that may influence the result.

References

- Al-Adamat, A. M., KassabAlserhan, M., Mohammad, L. S., Singh, D., Al-Hawary, S. I. S., Mohammad, A. A. S., & Hunitie, M. F. A. (2023). The Impact of Digital Marketing Tools on Customer Loyalty of Jordanian Islamic Banks. In *Emerging Trends and Innovation in Business and Finance* (pp. 105-118). Singapore: Springer Nature Singapore.
- Aldaihani, F. M. F., Mohammad, A. A. S., AlChahadat, H., Al-Hawary, S. I. S., Almaaitah, M. F., Al-Husban, N. A., ... & Mohammad, A. (2023). Customers' perception of the social responsibility in the private hospitals in Greater Amman. In *The effect of information technology on business and marketing intelligence systems* (pp. 2177-2191). Cham: Springer International Publishing.
- Al-Fakeh, F. A. A., Al-Shaikh, M. S., Al-Hawary, S. I. S., Mohammad, L. S., Singh, D., Mohammad, A. A. S., ... & Al-Safadi, M. H. (2023). The Impact of Integrated Marketing Communications Tools on Achieving Competitive Advantage in Jordanian Universities. In *Emerging Trends and Innovation in Business and Finance* (pp. 149-165). Singapore: Springer Nature Singapore.
- Al-Husban, D. A. A. O., Al-Hawary, S. I. S., AlTaweel, I. R. S., Al-Husban, N. A., Almaaitah, M. F., Aldaihani, F. M. F., ... & Mohammad, D. I. (2023). The impact of intellectual capital on competitive capabilities: evidence from firms listed in ASE. In *The effect of information technology on business and marketing intelligence systems* (pp. 1707-1723). Cham: Springer International Publishing.
- Alkhalwaldeh, M. I. G., Aldaihani, F. M. F., Al-Zyoud, B. A. A., Al-Hawary, S. I. S., Shamaileh, N. A., Mohammad, A. A. S., ... & Al-Adamat, O. A. A. (2023). Impact of internal marketing practices on intention to stay in commercial banks in Jordan. In *The effect of information technology on business and marketing intelligence systems* (pp. 2231-2247). Cham: Springer International Publishing.
- Alshura, M. S. K., Tayeh, S. S. A. A., Melhem, Y. S., Al-Shaikh, F. N., Almomani, H. M., Aityassine, F. L. Y., ... & Mohammad, A. A. S. (2023). Authentic leadership and its impact on sustainable performance: the mediating role of knowledge ability in Jordan customs department. In *The effect of information technology on business and marketing intelligence systems* (pp. 1437-1454). Cham: Springer International Publishing.
- Australian Small Business and Family Enterprise Ombudsman. (2021). Small business counts. Retrieved from <https://www.asbfeo.gov.au>
- Budiarto, D. S., Amanda, A., & Nordin, N. (2023). Digital Technologies Application and Competitive Advantage for MSMEs Sustainability and Market Performance. *Ekulilibrium: Jurnal Ilmiah Bidang Ilmu Ekonomi*, 18(2), 169-178.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Djpb.kemenkeu.go.id. (2023, June 27). Kontribusi UMKM Dalam perekonomian Indonesia. <https://djpb.kemenkeu.go.id/kppn/lubuksikaping/id/data-publikasi/artikel/3134-kontribusi-umkm-dalam-perekonomianindonesia.html>
- Djuwita, D., & Yusuf, A. A. (2018). Tingkat Literasi Keuangan Syariah Di Kalangan UMKM Dan Dampaknya Terhadap Perkembangan Usaha. *Al-Amwal: Jurnal Ekonomi Dan Perbankan Syariah*, 10(1), 105-127. <https://doi.org/10.24235/amwal.v10i1.2837>
- European Commission. (2021). Annual report on European SMEs 2019/2020. Publications Office of the European Union.
- Foster, C., & Heeks, R. (2018). Innovation and scaling of ICT for the bottom of the pyramid. *Journal of Information Technology*, 33(4), 310-326.
- Gao, J., Siddik, A., Abbas, S., Hamayun, M., Masukujjaman, M., & Alam, S. (2023). Impact of E-Commerce and Digital Marketing Adoption on Financial and Sustainability
- Gefen, D., & Straub, D. W. (1997). Gender differences in the perception and use of e-mail:
- Ghobakhloo, M., Iranmanesh, M., Vilkas, M., Grybauskas, A., & Amran, A. (2022). Drivers and barriers of Industry 4.0 technology adoption among manufacturing SMEs: A systematic review and transformation roadmap. *Journal of Manufacturing Technology Management*. <https://doi.org/10.1108/jmtm-12-2021-0505>
- Gui, Y., Fern, M. S., Shahrudin, M., Mokhtar, I. G. M., & Karmawan, Suryanto. (2021). Computing adoption in small medium enterprises of Indonesia's creative industry. *Semantic scholar*. <https://api.semanticscholar.org>
- Haque R., Senathirajah A.R.B.S., Khalil M.I., Qazi S.Z. & Ahmed S. (2024). A Structural Path Analysis Bangladeshi SMEs' Sustainability through Social Media Marketing. *Sustainability*, 16, 5433, 1-19.
- Hasibuan, L. S., Handayani, S., & Bismala, L. (2022). Analisis perbedaan tingkat literasi keuangan pelaku UKM. *Jurnal Ilmiah Ekonomi dan Bisnis*, 19(1), 86-93. <https://doi.org/10.31849/jieb.v19i1.7410>
- Hendrawan, S. A., Chatra, A., Iman, N., Hidayatullah, S., & Suprayitno, D. (2024). Digital <https://doi.org/10.1016/j.procs.2021.04.054>

- <https://doi.org/10.1108/S1571-038620200000027004>
- [https://ojk.go.id/en/berita-dan-kegiatan/publikasi/Documents/Pages/National-Strategy-on-Indonesian-Financial-Literacy-\(SNLKI\)-2021---2025/National%20Strategy%20on](https://ojk.go.id/en/berita-dan-kegiatan/publikasi/Documents/Pages/National-Strategy-on-Indonesian-Financial-Literacy-(SNLKI)-2021---2025/National%20Strategy%20on)
- <https://www.kominfo.go.id/content/detail/40915/transformasi-digital-umkm-jadi-prioritas-penguatan-fondasi-ekonomi/0/berita>
- https://www.kominfo.go.id/content/detail/58051/siaran-pers-no-475hmkominfo082024-tentang-tahun-2024-indonesia-targetkan-30-juta-pelaku-umkm-adopsi-teknologi-digital/0/siaran_pers
- Indonesia targetkan 30 Juta Pelaku UMKM adopsi teknologi digital. Website Resmi Jenderal Kekayaan Negara. <https://www.djkn.kemenkeu.go.id/kpkn-balikpapan/baca-artikel/15677/Peran-PentingUMKM-dalam-Ancaman-Isu-Resesi.html>
- Kalimantan Selatan. data.kalselprov.go.id <https://data.kalselprov.go.id/dataset/data/1156/column/y>
- Keberlangsungan UMKM di Kota Denpasar. *Warmadewa Management and Business Journal (WMBJ)*, 5(3), 1–9. <https://doi.org/10.22225/wmbj.2.1.1644.1-9>
- Kementerian Komunikasi dan Informatika RI.
- Khalil, A., Abdelli, M., & Mogaji, E. (2022). Do Digital Technologies Influence the Relationship between the COVID-19 Crisis and SMEs' Resilience in Developing Countries? *Journal of Open Innovation: Technology, Market, and Complexity*, 8, 100 – 100. <https://doi.org/10.3390/joitmc8020100>.
- Kinerja Dan Keberlanjutan Umkm Di Kabupaten Badung. *INVENTORY :Jurnal Akuntansi*, 4(1), 166–174
- Kominfo. (2022, March 31). Transformasi Digital umkm jadi prioritas Penguatan Fondasi ekonomi. Website Resmi Kementerian Komunikasi dan Informatika RI.
- Kominfo. (2024, August 5). Siaran Pers no. 475/HM/KOMINFO/08/2024 tentang tahun 2024,
- Lusardi, A., & Mitchell, O. S. (2017). Financial literacy and retirement preparedness: Evidence and implications for financial education programs. *Journal of Pension Economics & Finance*, 16(3), 297–311.
- Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., Félix, V.G., Ostos, R., Brito, H., Félix, R.A.
- Mathis, L., & Harrington, B. (2017). Sustainability Theory and Conceptual Considerations : A Review of Key Ideas for Sustainability, and the Rural Context. *Papers in Applied Geography*, 2(4), 365–382. <https://doi.org/10.1080/23754931.2016.1239222>
- Mohammad, A. A. S., Aityassine, F. L. Y., al-fugaha, Z. N. A., Alshurideh, M. T., Alajarmeh, N. S., Al-Momani, A. A., ... & Al-Adamat, A. M. (2024c). The Impact of Influencer Marketing on Brand Perception: A Study of Jordanian Customers Influenced on Social Media Platforms. In *Business Analytical Capabilities and Artificial Intelligence-Enabled Analytics: Applications and Challenges in the Digital Era, Volume 1* (pp. 363–376). Cham: Springer Nature Switzerland.
- Mohammad, A. A. S., Al-Qasem, M. M., Khodeer, S. M. D. T., Aldaihani, F. M. F., Alserhan, A. F., Haija, A. A. A., ... & Al-Hawary, S. I. S. (2023b). Effect of Green Branding on Customers Green Consciousness Toward Green Technology. In *Emerging Trends and Innovation in Business and Finance* (pp. 35–48). Singapore: Springer Nature Singapore.
- Mohammad, A. A. S., Barghouth, M. Y., Al-Husban, N. A., Aldaihani, F. M. F., Al-Husban, D. A. A. O., Lemoun, A. A. A., ... & Al-Hawary, S. I. S. (2023a). Does Social Media Marketing Affect Marketing Performance. In *Emerging Trends and Innovation in Business and Finance* (pp. 21–34). Singapore: Springer Nature Singapore.
- Mohammad, A. A. S., Khanfar, I. A., Al Oraini, B., Vasudevan, A., Suleiman, I. M., & Ala'a, M. (2024a). User acceptance of health information technologies (HIT): an application of the theory of planned behavior. *Data and Metadata*, 3, 394–394.
- Mohammad, A. A. S., Khanfar, I. A., Al Oraini, B., Vasudevan, A., Suleiman, I. M., & Fei, Z. (2024b). Predictive analytics on artificial intelligence in supply chain optimization. *Data and Metadata*, 3, 395–395.
- Musthafa, I., Handra, H., Bachtiar, N., Taifur, W. D., & Ariyanto, E. (2023). financial literacy and performance of micro, small and medium enterprises: a literature review. *Journal Of Management, Accounting, General Finance And International Economic Issues*, 3(1), 287–303.
- Ojk.go.id. (n.d.). Jangan Sepelekan Pentingnya Literasi Keuangan, Ternyata Ini Loh Manfaatnya! :: Sikapi :: <https://sikapiuangmu.ojk.go.id/FrontEnd/CMS/Article/20659>
- Otoritas Jasa Keuangan (OJK). (2021). National strategy on Indonesian financial literacy Performance of MSMEs during the COVID-19 Pandemic: An Empirical Study.
- Pichagonakesit, T., Ueasangkomsate, P., & Sudharatna, Y. (2023). Technology infrastructure, manufacturing technology, and sustainable manufacturing practice in SMEs. *International Journal of Business and Society*. <https://doi.org/10.33736/ijbs.5948.2023>
- Pramaswara and Athoillah (2023), Pengaruh Inklusi Keuangan Di Era Ekonomi Digital Dalam Meningkatkan Pertumbuhan Ekonomi. *Journal of Development Economic and Social Studies*, Vol. 2. No.1, 2023.
- Prasanna, R., Jayasundara, J., Gamage, S., Ekanayake, E., Rajapaksh, P., & Abeyrathne, G. (2019). Sustainability of SMEs in the Competition: A Systemic Review on
- Shen, Y., Hu, W., & Huang, C. J. (2021). Digital financial inclusion and economic growth: A cross-country study. *Procedia Computer Science*, 187, 218–223.
- Sulastrri. (2022, December 12). Peran penting UMKM Dalam Ancaman Isu Resesi. Direktorat
- Susan, M. (2020). "Financial Literacy and Growth of Micro, Small, and Medium Enterprises in West Java, Indonesia", Barnett, W.A. and Sergi, B.S. (Ed.) *Advanced Issues in the Economics of Emerging Markets (International Symposia in Economic Theory and Econometrics, Vol. 27)*, Emerald Publishing Limited, Leeds, pp. 39–48.
- Venkatesh, V., Morris, M. G., & Ackerman, P. L. (2000). A longitudinal fields investigation of gender differences in individual technology adoption decision-making processes. *Organizational behavior and human decision processes*, 83(1), 33–60.

- Vrontis, D., Chaudhuri, R., & Chatterjee, S. (2022). Adoption of digital technologies by SMEs for sustainability and value creation: The moderating role of entrepreneurial orientation. *Sustainability*, 14(13), 7949.
- Wang, Z., Lin, S., Chen, Y., Lyulyov, O., & Pimonenko, T. (2023). Digitalization effect on business performance: role of business model innovation. *Sustainability*, 15(11), 9020.
- Ye, J., & Kulathunga, K. M. M. C. B. (2019). How does financial literacy promote sustainability in SMEs? A developing country perspective. *Sustainability*, 11(10), 2990.