

Integration of Digital Technology in Micro, Small and Medium Enterprises (MSMES) Realization of *Smart City* (Case Study of Medan Denai District)

Muhammad Naufal Rahadian^{1*}, Tengku Irmayani², Nurman Achmad³
^{1,2,3} Universitas Sumatera Utara

Corresponding Author: Muhammad Naufal Rahadian
rahadian11061998@gmail.com

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ABSTRACT

This research aims to analyze the use of digital technology in the management of MSME centers as part of the strategy to realize a smart city in Medan Denai District, as well as contribute to the understanding of digital integration in the local economy. Using a qualitative descriptive method, this study examines three main concepts digital literacy, the use of digital platforms, and government support through interviews with MSME actors, field observations, and document reviews conducted in March-May 2024. The results of the study show that the use of digital technology is still limited to marketing through social media, while financial management applications and online market connections are not optimal due to low digital literacy. Government support, such as online licensing and access to digital financing, is available but has not been balanced by intensive assistance. This research implies the need for an integrated digital system and a sustainable digital literacy program to strengthen the competitiveness of MSMEs and support an inclusive smart city ecosystem.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) have a strategic position in national economic development, including in the Medan City area. MSMEs are not only the largest providers of employment, but also the main drivers of the local community's economy. However, major challenges arise when the sector is faced with the dynamics of digital transformation that is increasingly rapid. Many MSME actors in Medan have not been able to keep up with the changing times due to limited digital literacy, access to technology, and lack of policy and infrastructure support. According to data from the Medan Communication and Information Service, around 82% of Medan residents have internet literacy portal.pemkomedan.go.id. This shows the potential for digital adoption, but gaps still emerge in terms of deeper literacy (digital skills, ethics, security, etc.). The Government's Efforts in MSME Digital Literacy The Medan City Government is actively encouraging digital literacy through various programs such as Digital Literacy Week and trainings for MSMEs to be included in the local e-catalog and support [digital marketing portal.pemkomedan.go.id](http://digital.marketing.portal.pemkomedan.go.id).

In the current era, big cities including Medan are directed towards the development of *smart cities*, namely the concept of a smart city that integrates information and communication technology (ICT) in all aspects of life, including the economic sector. In the framework of *smart cities*, MSMEs should be an important part of the city's digital ecosystem. The use of digital technology such as *e-commerce*, *point of sales* (POS) applications, digital financial management systems, and integration with logistics platforms and cashless payments are important elements that enable MSMEs to transform into more adaptive, efficient, and competitive business units in the digital economy era.

Unfortunately, the implementation of *smart cities* in Medan still does not optimally touch the MSME sector. Many MSME actors still manage their businesses conventionally. Lack of awareness of the benefits of technology, limited digital training, and unaffordability of technological devices are major obstacles. A study by Brina & Siahaan (2024) states that the digitalization of MSMEs in Medan City has not been optimal. The main obstacles include uneven distribution of digital training, low motivation of MSME actors, and limited human resources and supporting facilities at the Medan Cooperatives & MSMEs Office. In fact, if encouraged to enter the digital economy ecosystem, MSMEs can expand their market reach nationally and even globally, increase productivity through automation, and create new jobs that are more modern and technology-based. The transformation towards a digital economy is not only changing the way we do transactions, but also creating a new economic pattern that is more connected and inclusive. In this context, MSMEs must be positioned as the main actors in building a *digital economy ecosystem*. The Medan City Government needs to be more serious about making MSMEs the main target of smart city development policies.

Smart city initiatives do not stop at the development of digital infrastructure and e-government, but must include support for the digitalization of people's businesses through digital marketing training, technology adoption incentives, institutional strengthening, and ease of integration of MSMEs into

government digital platforms. Problems such as uneven digital literacy, lack of skilled human resources, limited funding for technology transformation, and suboptimal ICT infrastructure show the need for a systemic and multi-sector approach involving local governments, Communication and Informatics, banking/fintech, network operators, universities, and the technology community. Data from Kominfo/IMDI, ILD 2024, and BPS Medan strengthen the urgency of this collaboration.

Nationally, MSMEs are the backbone of the Indonesian economy with 65.4 million business units (99.9% of business actors), absorb 119.6 million workers (97%), and contribute 60.5% to GDP (Ministry of Cooperatives and SMEs, 2022). In North Sumatra, there are more than 2.3 million MSMEs that play a major role in the trade, services, and small industry sectors. In the city of Medan, especially Medan Denai District, the development of MSMEs is quite rapid with more than 3,500 business units (Dinkop MSMEs Medan, 2022). However, this growth is still hampered by limited capital, low digital literacy, limited market access, and not optimal use of social media, marketplaces, and e-commerce. Therefore, the integration of MSMEs into the smart city framework is a strategic step to increase the competitiveness of the local economy and strengthen an inclusive digital economy ecosystem. With these conditions, the comparison of MSME data in Indonesia, North Sumatra, and Medan Denai District can be seen as follows:

Table 1. Comparison of MSMEs

Region	Number of MSMEs	Labor Contribution	Contribution to GDP/Economy
Indonesia	± 65.4 million	± 119.6 million people (97%)	± 60.5% of National GDP
North Sumatra	± 2.3 million	± 4.5 million people	± 58% of the Regional Economy
Medan Denai District	± 3,500	± 7,000 - 10,000 people	Dominance of the local trade and services sector

Source: Data processed by researchers (2025)

From this data, it can be seen that MSMEs in Medan Denai District, although relatively small compared to the provincial and national scales, still have an important role in driving the local economy. If supported by adequate digital facilities, product innovation, and effective marketing strategies, MSMEs in Medan Denai District have the potential to grow more rapidly, increase competitiveness, and contribute more to the overall economic growth of Medan City.

Thus, this research is important to examine more deeply the conditions, challenges, and opportunities of MSMEs in Medan Denai District, especially in relation to the use of digital technology as a means of business development.

Table 2. Number of Integrated MSME Centers in Medan Denai District

Yes	Business Field	Number of Efforts
1	Convection	20 attempts
2	Shoes/Sandals	5 Attempts
3	Batik	1 attempt
4	Food/Beverage	3 Attempts
5	Screen printing	1 attempt
Total		30 attempts

Source: Data processed by researchers (2025)

Based on data collected from Micro, Small, and Medium Enterprises (MSMEs) in Medan City, it is known that the convection sector dominates with 20 business units, followed by businesses in the shoe and sandals sector with 5 business units, then the food and beverage sector with 3 business units, and 1 business unit each in the batik and screen printing sectors. In total, there are 30 active MSME units in the region engaged in skills-based productive economic sectors.

Table 3. Average Income of Integrated MSME Center Medan Denai District

No.	Business Field	Number of Efforts	Estimated Revenue per Business (Rp/Month)
1	Convection	20 attempts	2.000.000 - 3.000.000
2	Shoes/Sandals	5 Attempts	2.000.000 - 3.000.000
3	Batik	1 attempt	2.000.000 - 3.000.000
4	Food/Beverage	3 Attempts	2.000.000 - 3.000.000
5	Screen printing	1 attempt	2.000.000 - 3.000.000
Total		30 attempts	—

Source: Researcher Survey Data

Based on data on the number of businesses in Medan Denai District, there are a total of 30 units of micro, small, and medium enterprises (MSMEs) engaged in various fields. These types of businesses include convection as many as 20 businesses, shoes/sandals as many as 5 businesses, batik as many as 1 business, food/beverages as many as 3 businesses, and screen printing as many as 1 business. When viewed from the estimated average income per business, each MSME in Medan Denai District is estimated to earn an income of IDR 2,000,000 to IDR 3,000,000 per month. Thus, the business in the convection sector with the most number, which is 20 units, has the potential to contribute the largest revenue compared to other business fields.

Meanwhile, even though the number of batik and screen printing business units is only one, both still contribute income with the same estimate, which is between IDR 2,000,000 to IDR 3,000,000 per month. Overall, the income potential of MSMEs in Medan Denai District is quite significant. With a total of 30 active businesses, the combined income range that can be generated reaches IDR 60,000,000 to IDR 90,000,000 per month. This shows that MSMEs play an important role in driving the local economy, especially in improving community welfare through independent business activities in various sectors. In an effort to encourage people-based economic growth and accelerate digital transformation, a number of regions in Indonesia have successfully integrated the concept of *smart city*, digital technology, and the local economy into the management of Micro, Small, and Medium Enterprises (MSMEs). This success can be used as a model or strategic reference in the development of Integrated MSME Centers in Medan City.

Table 4. Comparison of MSMEs in Medan City

Yes	District	MSME Centers / Business Clusters	Access to Digital Infrastructure	Training/Mentoring	Key Challenges	Special Notes
1	Trail Terrain	Integrated MSME Center, dominant culinary and trade	Limited, some have not taken advantage of the marketplace	Training is not routine, participation is low	Low digital literacy, limited capital, minimal ICT infrastructure	Great potential if Smart City integration is optimal
2	Sandpaper Field	Convection clusters and services	Internet access is quite good, some are already GoFood/GrabFood	There is training from the Cooperative Office	Fierce price competition	Strategic location near the terminal
3	Medan Area	Culinary and repair services	Simply use social media	Active community mentoring	Limited access to capital	Near the city center, a large traditional market
4	Field of Words	Retail and culinary trade	Relatively good, many sellers in the marketplace	Some private & campus training	High competition	Near campus, a base for young people
5	Maimun Field	Souvenirs, special culinary specials	Quite high digitization	There is tourism support	Limited capital & human resources	Cultural tourism area

Source: Data processed by researchers (2025)

The Integrated MSME Center in Medan City has a great opportunity to be developed as a center for local digital economy empowerment. With a diversity of businesses such as convection, shoes, bags, food-beverages, and screen printing, Medan Denai can replicate the good practices of other cities through several strategies: building a sub-district-based local e-marketplace, establishing a digital training center in collaboration with campuses and the IT community, integrating MSMEs with POS applications and cashless payments, and establishing an MSME data center as the basis for data-driven policy planning. These measures will encourage MSMEs to upgrade and strengthen the smart economy within the framework of the Smart City of Medan. The great potential of Medan MSMEs has not been fully utilized because the majority of business actors are still operating manually and have minimal use of digital technology. In fact, the use of marketplaces, social media, product design applications, and digital financial management can expand the market and increase production efficiency. The biggest obstacles that arise are low digital literacy, limited training, and lack of technological assistance. A study by the Accounting Journal (2022) also shows that people in Medan Sandpaper, Medan Denai, and Medan Area still make little use of financial technology in MSME transactions. Research (Titi, 2019) found that the Medan City Government tends to implement a ceremonial approach in fostering MSMEs without a long-term strategic plan.

Training is formal and not ongoing. (Fredick, 2020) added that budget alignment for MSMEs is only around 1.3% of the total regional development budget, without a special allocation for MSME digitalization. (Alfian, 2020) also noted that there is no integrated MSME database so that assistance and training are often not on target. Field conditions reinforce these findings. MSMEs are still operating informally, lack internet facilities and digital devices, and lack community technology service centers. Although the Medan City Government has established an MoU with PNM, BRI, Pegadaian, and Bank Indonesia, this collaboration has not yet touched the specific sub-district level. Therefore, without responsive policies, adequate budgets, and strong political commitments, it is difficult to realize the digitalization of MSMEs in Medan optimally. Therefore, the research gap addressed in this study is empirical rather than theoretical. Existing literature has sufficiently elaborated the concepts of MSME digitalization, smart cities, and inclusive digital economies. What remains underexplored is how these concepts are implemented, experienced, and negotiated by MSME actors at the sub-district level, particularly in areas such as Medan Denai.

There is limited field-based evidence that captures the actual conditions, constraints, and adaptive strategies of MSMEs in engaging with digital technologies within the smart city agenda. Based on this gap, this research focuses on examining the real conditions, challenges, and opportunities faced by MSMEs in Medan Denai District in adopting digital technologies. By grounding the analysis in empirical data, this study aims to provide practical insights for designing more responsive smart city policies, strengthening MSME digital capacity, and fostering an inc.

THEORETICAL REVIEW

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), is a theoretical framework used to explain the process of technology acceptance and use by individuals and businesses. This model emphasizes that an individual's decision to adopt technology is not solely determined by the availability of the technology itself, but is heavily influenced by two key constructs: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which an individual believes that using technology will improve their business performance or productivity, while perceived ease of use relates to the belief that the technology is easy to understand and operate without requiring significant effort.

In the context of MSMEs in Medan Denai District, the TAM is relevant for explaining the low rate of digital technology adoption despite the availability of internet infrastructure and various digitalization programs. MSMEs generally do not exhibit ideological rejection of technology, but still perceive that digital technology does not provide tangible benefits for business development, tends to be complicated, and requires high costs. Furthermore, the lack of ongoing mentoring makes it difficult for MSMEs to integrate technology into their daily business practices. This situation aligns with the basic assumption of TAM, which states that low technology adoption is driven more by limited user perception and capacity, rather than resistance to innovation. Therefore, TAM helps explain why various ceremonial digital training programs have not been able to drive changes in business practices, resulting in MSMEs remaining stuck with conventional management patterns despite the availability of infrastructure support.

Digital Divide Theory

The digital divide theory proposed by van Dijk (2005) explains that inequality in the use of information and communication technology is not solely determined by the availability or lack of access to the internet and digital devices. The digital divide is understood as a multidimensional phenomenon encompassing three main aspects: access to technology, digital skills, and the ability to strategically utilize technology to improve quality of life and economic activity. Therefore, ownership of digital devices or the availability of an internet connection does not automatically guarantee effective technology adoption if it is not accompanied by adequate knowledge and skills.

In the context of MSMEs in Medan City, particularly in Medan Denai District, the digital divide theory is relevant in explaining the paradox between high levels of internet access and low levels of digital technology utilization by businesses. Although the majority of the population has internet access and devices, many MSMEs are unable to utilize these technologies productively, such as for digital marketing, app-based financial recording, or integration with marketplace platforms. This situation indicates that the main problem lies not in the availability of technology, but rather in limited digital literacy and strategic ability to use technology for business development. Therefore, the digital divide

theory helps to understand that high access does not always equate to effective technology adoption, and emphasizes the importance of policy interventions that focus not only on providing infrastructure, but also on capacity building and ongoing mentoring for MSMEs.

METHODOLOGY

This study uses a qualitative descriptive approach to understand in depth the use of digital technology by MSME actors in Medan Denai District, the ideal type of technology for Smart City-based MSME centers, as well as the form of support from the Medan City Government. Through interviews, observations, and documentation studies, this approach allows researchers to describe in detail the perceptions, experiences, obstacles, and digitalization strategies carried out by MSMEs and local governments.

The research is also exploratory as well as a case study, because it focuses on one specific area so that the analysis can be more contextual. The research was carried out in Medan Denai District, which was chosen because it has high economic activity of MSMEs but the level of use of digital technology is still low. This location is relevant to assess the readiness of MSMEs towards the Smart City ecosystem. Informants were determined through purposive sampling, including MSME actors, officials of the Cooperative Service and the Communication and Information Service, representatives of financial institutions, digital platform managers, and academics.

The criteria for informants include involvement in MSME businesses, experience in using digital technology, and role in MSME digitalization programs (Sugiyono 2018). Data collection techniques include in-depth interviews, field observations, and documentation studies from government documents, BPS data, and digitalization program reports. To ensure the validity of the data, the study used triangulation of sources, techniques, and time (Sugiyono 2018). The data is analyzed using an interactive analysis model, including data reduction, data presentation, and repeated conclusion drawing to maintain validity.

RESULTS

Digital Platform used by MSMEs in Medan Denai District

The use of digital platforms by MSMEs in Medan Denai District shows positive developments, although it is still partial. The majority of business actors have used social media such as Instagram, Facebook, and TikTok for promotion, as well as utilizing e-commerce such as Shopee, Tokopedia, and Lazada as sales channels. However, digitalization is still limited to the marketing aspect and has not been integrated with business management, such as financial recording, stock management, and digital payments.

The results of the study show that MSME actors still have limited knowledge in maximizing technology. To support the management of Smart City-based MSME centers, an integrated digital system is needed that includes an integrated local marketplace, a business information system based on government databases, and a digital training platform that provides e-learning materials related to financial management, digital marketing, branding, and

supply chain. The Medan City Government's support for the digitalization of MSMEs is considered to be already existing but not optimal. Programs such as KUR and OSS have been introduced, but they still face obstacles due to the low digital literacy of business actors.

Cooperation with banks and marketplaces is already underway, but collaboration with universities, the technology community, and the private sector is still limited. The training provided by the government tends to be one-way and lacks continuous assistance, so that the improvement of MSMEs' digital capabilities has not been maximized. In the digital era, strengthening infrastructure and integrated assistance is the key to encouraging the productivity and competitiveness of Medan Denai MSMEs.

Internet and Telecommunications Access

Most of the Medan Denai area has been reached by fiber optic and cellular-based internet networks (4G/5G). This makes it easier for MSME actors to carry out digital-based business activities, such as online promotions, non-cash transactions, and communication with customers through digital platforms.

Social Media as a Marketing Tool

MSME actors in Medan Denai use social media such as Instagram and WhatsApp Business to introduce their products. Social media is not only used as a digital storefront, but also as a space for interaction with consumers, promotion through creative content, and expanding market reach outside the sub-district area.

Marketplace and E-Commerce

Marketplace platforms such as Shopee, Tokopedia, Lazada, and Bukalapak are the main means for MSMEs to sell products online. By utilizing these platforms, business actors can reach a wider range of consumers, even up to the regional and national levels, without being limited by geographical distance.

Digital Payment System

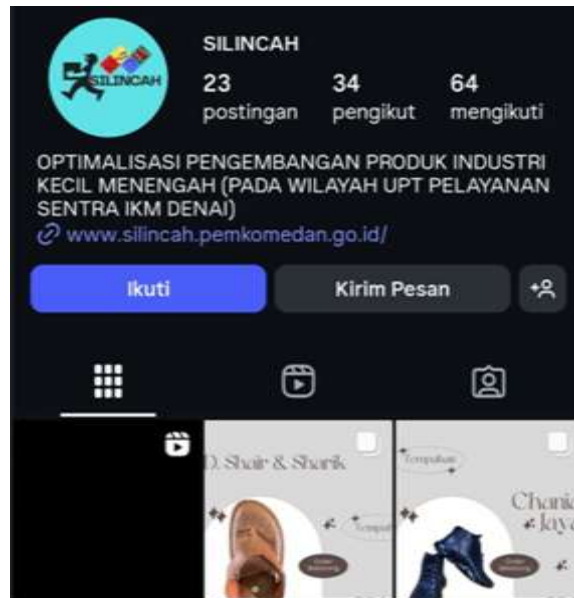
The use of e-wallets and mobile banking is growing among Medan Denai MSME actors. Applications such as GoPay, OVO, Dana, LinkAja, and QRIS facilitate transactions between sellers and buyers quickly, securely, and efficiently. This also encourages the creation of a more transparent digital financial ecosystem.

Digitalization Program Support

The Medan City Government through related agencies has also encouraged the MSME digitalization program, for example through online marketing training, the use of digital financial applications, and the facilitation of QRIS integration for payments. This step aims to enable MSMEs in Medan Denai to adapt to technological developments and not be left behind in market competition.

Challenges of Digital Infrastructure Utilization

Although digital facilities are growing, there are still several obstacles faced, including: limited digital literacy for some MSME actors, lack of ability to create interesting creative content, and limited capital to expand digital-based marketing. Therefore, continuous assistance and training are needed so that the use of digital infrastructure can run optimally.



Source: Instagram www.silincan.pemkomedan.go.id

Figure 1. Digital Infrastructure of MSMEs Medan Denai (Instagram)

Instagram is one of the digital infrastructures that is most widely used by MSME actors in Medan Denai District to develop their businesses. As a visual platform, Instagram functions as a digital storefront that displays culinary, fashion, handicrafts, and creative services products through photos, videos, reels, and stories. Its use helps businesses expand the market, build product image, and create direct interaction with consumers through DM, comment, and live streaming features. In addition to organic promotion, Instagram Ads provide an opportunity to reach more specific target consumers. However, the ability to create creative content, consistency of account management, and advertising costs are obstacles for most MSME actors.

The use of Instagram and other digital platforms reflects the initial achievements of the three pillars of Smart City: Smart People, Smart Economy, and Smart Governance. In the Smart People aspect, MSME actors show an increase in digital literacy even though it is still in the early stages. They have dared to try technology, become digital communicators, and begin to understand the importance of branding. However, in order for the transformation towards Smart People to be more optimal, further training, branding assistance, and strengthening the MSME digital community are needed. In the Smart Economy aspect, the presence of e-commerce and digital payments such as QRIS, OVO, GoPay, and Dana has helped MSMEs enter a more efficient digital economy ecosystem.

Collaboration with universities, the technology community, and the private sector also needs to be strengthened to create a sustainable digital ecosystem. Interviews with three MSME actors, Mrs. Citra (Bag seller), Ms. Novi (Tailor), and Mr. Chaniago (Leather shoe seller) show that the use of digital platforms is still in the early stages. Only Ms. Citra uses Instagram and TikTok sporadically, while the other two still rely on offline transactions and WhatsApp. This is in line with the Technology Acceptance Model (Davis, 1989), that the acceptance of technology is influenced by perceived benefits and ease of use. MSME actors know the benefits of digital marketing, but have not felt the convenience due to the lack of digital literacy and lack of technical assistance. From the perspective of the Resource-Based View (Barney, 1991), all three have the advantages of production skills, but the weaknesses in digital distribution cause their markets to remain limited.

The three respondents also faced similar obstacles: limited capital, labor, stock management, and financial management, as well as the lack of government assistance which was considered more in the form of socialization. This shows that there is a gap between policy and implementation, as conveyed in the theory of MSME empowerment by (Tambunan, 2012) that the government needs to provide real assistance, easy access to capital, and effective marketing facilitation. Overall, MSMEs in Medan Denai have great potential to develop through digital platforms such as Instagram, but it requires strengthening digital literacy, intensive mentoring, integrated information systems, and real government support to accelerate the transformation towards an inclusive and sustainable Smart City ecosystem.

Form of Support of the Medan City Government in developing MSMEs

The Medan City Government has a strategic role in creating a business ecosystem that is conducive to the development of Micro, Small, and Medium Enterprises (MSMEs). The support provided is not only administrative, but also includes aspects of funding, mentoring, and the use of digital technology. In general, the form of support of the Medan City Government can be seen in three main dimensions, namely regulation, facilitation, and collaboration. In terms of regulations, the Medan City Government seeks to simplify the business legality process through an online-based licensing system that is integrated with OSS (*Online Single Submission*). This bureaucratic simplification aims to enable MSMEs to obtain legality faster, so that they have legal certainty and wider access to government programs and financial institutions.

In addition, local governments also provide supporting regulations in the form of tax incentives and light levies that ease the burden on MSMEs.



Source: Prokopim Pemko Medan.go. id

Figure 2. Mr. Bobby Nasution when he served as Mayor of Medan Empowering MSMEs Shoes

The efforts of the former Mayor of Medan, Bobby Nasution, in encouraging MSMEs to upgrade are realized through the policy of making the Medan City Government a market for local products. One of the concrete steps is to require OPDs to use official shoes for MSME production, especially from Medan Denai District. In addition, the establishment of MSME cooperatives facilitated by the Cooperative Office shows institutional strengthening and systematic mapping of production facility needs. The integration of digital technology in business management further strengthens the modern and competitive MSME ecosystem, in line with the vision of Smart City Medan and the potential of Medan Denai as a pilot project for digital-based MSME centers.



Source : <https://diskominfo.sumutprov.go.id>

Figure 3. The Provincial Government Continues to Support MSME Actors in North Sumatra

Support for MSMEs in North Sumatra is a priority for the Provincial Government and the Medan City Government because of their strategic contribution to national economic growth. The Governor of North Sumatra, Muhammad Bobby Afif Nasution, emphasized that the national economic growth target of 8 percent can be achieved through strengthening MSMEs.

As the fourth largest province in Indonesia, North Sumatra is targeted to be able to contribute 6.5-7 percent economic growth, so that the development of MSMEs in big cities such as Medan has a direct impact on these achievements. The Medan City Government has implemented various programs to increase the competitiveness of MSMEs, ranging from simplifying OSS-based licensing,

facilitating access to digital financing, to digital literacy training. This policy is in line with the direction of the Minister of MSMEs, Maman Abdurrahman, who encourages cross-ministerial collaboration to remove sectoral egos and simplify the licensing process.

In addition, the Medan City Government is expanding collaboration with universities, the business community, and technology companies to build an inclusive and adaptive MSME ecosystem. This effort supports the North Sumatra Provincial Government's vision of placing MSMEs as the driving force of the regional economy. Through a combination of government policies and the use of digital technology, MSMEs in Medan Denai play an important role in strengthening the local economy and encouraging the transformation of Medan City towards a sustainable smart city.



Source: Medan City Communication and Informatics Office

Figure 4. Support of Various Medan MSME Stakeholders to Upgrade and Go National

The growth of MSMEs in Medan City, including Medan Denai District, is a priority in encouraging community economic independence. The Medan City Government together with universities and community organizations collaborate to strengthen the development of MSMEs so that they can grow faster and be competitive. The four main pillars of capital, production, marketing, and human resources are the focus of the mentoring program. Access to capital is expanded through cooperation with financial institutions, while the production sector is improved through quality coaching and halal certification. In terms of marketing, MSMEs are encouraged to utilize digital technology such as social media, marketplaces, and e-commerce. Human resource strengthening is carried out through entrepreneurship and digital literacy training. This policy is in line with the vision of Smart City which emphasizes digitalization to improve the efficiency and professionalism of MSMEs. The use of digital platforms helps expand the market to the national level. The development of MSMEs also has a direct impact on the local economy increasing economic turnover, creating jobs, and strengthening people's purchasing power.



Source : <https://news.detik.com/berita/d-5831266>

Figure 5. Supporting MSMEs to Rise, Medan City Government Encourages Construction & Technology Adoption

The support of the Mayor of Medan, Bobby Nasution, shows the Medan City Government's strong commitment to encouraging MSMEs to upgrade through digital transformation. The coaching is not only focused on conventional aspects, but also on strengthening digital marketing, product quality, and technological capabilities. Many MSMEs have potential products, but are still weak in digital packaging and promotion, so the government provides strategic interventions on training, technology, and improving production standards. Within the framework of the four pillars of MSMEs, the Medan City Government makes concrete efforts: easy access to capital through credit programs and financial partnerships; improvement of production quality, including standardization of packaging; expansion of marketing through integration into government e-Catalogs; and strengthening human resources through digital literacy training.

This strategy is in line with the vision of Smart City which places digitalization as the main instrument in the development of MSMEs. In addition, the Medan City Government's policy that requires the use of local products in the government environment and expands MSMEs' access to various promotional events is able to maintain the community's economic turnaround. The government also strengthens the ecosystem through the provision of digital infrastructure, access to financing, periodic training, and collaboration with universities and the business community. Although they still face challenges in literacy and technology adoption, continuous assistance and monitoring are the key for MSMEs to be truly competitive in the digital economy era.



Source : <https://diskominfo.sumutprov.go.id>

Figure 6. Mr. Bobby Nasution Says Hard Work Still Needs to Improve the Level of North Sumatra MSMEs

The statement of the Governor of North Sumatra, Bobby Nasution, regarding the low access to financing for MSMEs (7.7%), the use of technology (19%), involvement in the digital ecosystem (3%), and the lack of young entrepreneurs (0.08%), shows that there is a large gap between the potential of MSMEs and the use of available facilities.

This condition confirms the need for more concrete policy implementation at the city level, including the city of Medan as the provincial economic center. In this context, the support of the Medan City Government is very important. Through the simplification of OSS-based licensing, the Government encourages legality and more professional governance of MSMEs, in line with the business administration challenges conveyed by the Deputy Governor of BI, Destry Damayanti. In addition, digital literacy programs and entrepreneurship training involving universities, the business community, and technology companies are strategic steps to address the low adoption of technology. This effort aims to build a digital ecosystem that strengthens the capacity of MSMEs and encourages smart city-based economic transformation.

The importance of cross-sector collaboration in the development of MSMEs was also emphasized by the provincial government and Bank Indonesia. The Head of BI North Sumatra, Rudi B. Hutabarat, noted an increase in MSME exports of up to IDR 49.6 billion as of June 2025, showing the great potential of MSMEs to enter the global market. In this context, the Medan City Government's support through strengthening branding, digital marketing, and facilitating the participation of MSMEs in various promotional events is an important strategy to open wider market access.

Government efforts such as ease of OSS licensing, access to digital financing, market promotion, and the establishment of cooperatives and digital training show consistency with the three pillars of Smart City. First, Smart Governance, is realized through online licensing services and local product procurement policies by OPDs as a form of *Governance as a Market Creator*. Second, Smart Economy, can be seen from the encouragement for MSMEs to enter the marketplace, the use of financial technology, and the development of information system-based cooperatives. Third, Smart People, built through

digital marketing training and business assistance that strengthens the capacity of MSME actors. For all of these initiatives to be effective, intensive assistance and continuous monitoring are needed so that the participation of MSMEs in the digital ecosystem increases in quality and has a direct impact on regional economic growth.

DISCUSSION

Integration of Digital Technology in Micro, Small and Medium Enterprises (MSMEs) Realization of Smart City (Case Study of Medan Denai District)

The use of digital platforms by MSMEs in Medan City shows significant developments, especially in marketing through social media. Platforms such as Instagram, Facebook, and TikTok are the top choices because they are easy to use, interactive, and able to reach consumers widely. MSME actors use story, feed, reels, and live streaming features to show the production process, provide price information, promote discounts, and interact directly with potential buyers. Some more adaptive MSMEs have also started using creative content based on short videos on TikTok by utilizing music trends, challenges, and influencer collaborations to increase engagement.

However, the marketing strategy used is still dominated by a product-centric approach, which focuses on disseminating product information without analyzing consumer behavior. More measurable digital marketing techniques such as ad targeting, SEO marketplace, email marketing, audience segmentation, or data-driven marketing are still rarely applied. As a result, the reach of promotions is often limited to existing followers. The integration of social media with the marketplace is also still low. Many MSME actors have not connected their Instagram or Facebook accounts with the shop/catalog feature that can directly direct buyers to Shopee or Tokopedia. In addition, the use of analytics tools such as Instagram Insights or Facebook Analytics is also still minimal due to the limitations of digital literacy and lack of technical training. Overall, social media has indeed become the backbone of digital marketing for Medan City MSMEs, but its effectiveness can still be increased through more targeted strategies, the use of analytics, cross-platform integration, and ongoing mentoring.

The financial management of MSMEs in Medan City is still dominated by manual recording, both in the form of notebooks and simple spreadsheets. Only a small percentage of MSME actors use digital financial applications such as BukuWarung, Smart Cashier, or Mekari. The application actually provides complete features such as daily transaction recording, cash flow monitoring, stock management, automatic income statements, digital payment integration (QRIS/e-wallet). However, the low level of digital literacy makes many business actors only use applications limited to recording sales, without utilizing financial analytics features to see sales trends, profit margins, or production cost efficiency. Another problem is the mixing of personal and business finances. Many MSMEs use one account for all transactions, making it difficult to accurately assess the financial performance of a business.

This has a direct impact on the difficulty of accessing financing because banks need a clear transaction track record. In addition, the limitations of digital

financial training and premium feature subscription fees make some MSMEs reluctant to switch to a digital recording system. In fact, neat financial data is an important requirement to get banking financing or venture capital. Most MSMEs utilize national marketplaces such as Shopee, Tokopedia, and Lazada to expand market reach and facilitate online transactions. MSMEs that are more adaptive take advantage of promotional features such as free shipping vouchers, flash sales, discounts, and store ratings to increase sales.

However, many MSME players do not understand how to optimize digital stores, such as the use of keywords, customer review management, price strategy settings, marketplace paid advertising, photo management and product descriptions MSME access to international markets is still limited. Few businesses have tried platforms like Alibaba or Etsy, and even that is constrained by language skills, understanding of export regulations, and lack of logistical support. The integration of social media marketing strategies with marketplaces (social commerce) has begun to be implemented by some MSMEs, for example by directing buyers from Instagram or TikTok to Shopee/Tokopedia.

CONCLUSIONS AND RECOMMENDATIONS

This study finds that the utilization of digital platforms by MSMEs in Medan City remains largely confined to basic functions such as product promotion through social media and participation in online marketplaces. Limited digital literacy and technical capabilities constrain MSMEs' ability to develop more advanced digital strategies, including data-driven digital marketing, application-based financial management, and structured online market expansion. These findings are consistent with previous studies on MSME digital transformation in developing urban contexts, which emphasize that access to digital infrastructure alone is insufficient without sustained capacity building and institutional support (OECD, 2021; UNCTAD, 2020).

Within the smart city framework, this research reinforces existing literature that positions MSMEs as critical actors in the urban digital economy (Nam & Pardo, 2011; Anthopoulos, 2017). However, the empirical evidence from Medan City shows that smart city initiatives have not yet been fully translated into integrated digital ecosystem support for MSMEs. Although the Medan City Government has introduced programs related to digital financing, online licensing, and MSME training, these interventions remain unevenly distributed and insufficiently coordinated. Similar patterns of fragmented implementation have also been identified in previous studies on local-level digital policy execution in Indonesian cities (Titi, 2019; Brina & Siahaan, 2024). The study supports the argument found in the MSME and smart economy literature that digitalization requires integrated systems rather than isolated tools (Zhang et al., 2020).

The development of MSME centers should therefore encompass interconnected digital functions, including e-commerce integration, real-time financial and inventory management, business performance analytics, and continuous digital training and mentoring. Evidence from successful smart MSME models in other regions demonstrates that dashboard-based systems can significantly enhance managerial decision-making and operational efficiency

(World Bank, 2022). In terms of policy and practical implications, this research aligns with previous findings that emphasize the importance of sustainable digital literacy programs tailored to local contexts (UNESCO, 2021).

Continuous training at the sub-district level, rather than short-term or ceremonial programs, is crucial to ensuring lasting digital capability improvements among MSME actors. Furthermore, strengthening access to digital financing through collaboration with banking and fintech institutions by leveraging transactional data as alternative credit scoring mechanisms reflects best practices in inclusive finance for MSMEs highlighted in recent studies (ADB, 2021). Finally, the study confirms literature that stresses the role of cross-sectoral collaboration in building resilient smart economic ecosystems (Caragliu et al., 2011). Collaboration among local governments, universities, business communities, financial institutions, and technology companies is essential to operationalize the concept of a *Smart MSME Hub*.

FURTHER STUDY

Future research should examine digital technology integration in MSMEs across broader regions to support smart city development.

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REFERENCES

- Amalia, R. (2021). *Optimalisasi Sentra UMKM Melalui Kemitraan Strategis*. Jurnal Kewirausahaan dan Pengembangan Bisnis, 5(1), 56–70.
- Andriani, R. (2020). *Strategi Pengembangan Usaha Mikro, Kecil, dan Menengah (UMKM) di Indonesia*. Jakarta: Penerbit Mitra Wacana.
- Bowen, G. A. (2020). *Document Analysis as a Qualitative Research Method*. Qualitative Research Journal, 20(2), 177–190. Emerald Group Publishing.
- Creswell, J. W. (2020). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Thousand Oaks, CA: SAGE Publications.
- Darmawan, A. (2020). *Pengembangan Usaha Mikro, Kecil, dan Menengah (UMKM) dalam Meningkatkan Daya Saing Ekonomi*. Jakarta.
- Fitriani. (2020). *Strategi Pengembangan Sentra UMKM di Kawasan Perkotaan untuk Meningkatkan Perekonomian Daerah*. Yogyakarta: Deepublish.
- Flick, U. (2020). *Introducing Research Methodology: Thinking Your Way Through Your Research Project* (3rd ed.). Thousand Oaks, CA: SAGE Publications.
- Hadiyati, Endang. "Peningkatan Kinerja UMKM melalui Inovasi Produk dan Pemasaran: Sebuah Studi pada UMKM di Indonesia." *Jurnal Ekonomi dan Bisnis*, vol. 10, no. 2, 2015, pp. 112-125.
- Hamalik, O. (2020). *Pengembangan Usaha Mikro, Kecil, dan Menengah (UMKM): Strategi dan Kebijakan*. Jakarta: [Deepublish].
- Handayani, R. (2021). *Pengaruh Pengembangan Sentra UMKM terhadap Peningkatan Pendapatan Masyarakat di Kabupaten Sleman*. Jurnal Ekonomi dan Pembangunan Daerah, 10(2), 45–58.
- Hidayah, N. (2022). *Pengaruh Pelatihan Manajemen terhadap Efektivitas Sentra*

- UMKM. *Jurnal Pendidikan Ekonomi dan Kewirausahaan*, 5(1), 22–36.
- Irawan, D. (2020). *Pengelolaan Usaha Mikro, Kecil, dan Menengah (UMKM) untuk Meningkatkan Daya Saing*. Yogyakarta: [APA].
- Kementerian Koperasi dan UKM. (2018). *Laporan Tahunan UMKM 2018*. Jakarta: Kementerian Koperasi dan UKM.
- Kementerian Koperasi dan UKM. (2019). *Pengembangan Sentra UMKM Terpadu 2019*. Jakarta: Kementerian Koperasi dan UKM.
- Kotler, P., & Armstrong, G. (2018). *Principles of Marketing* (17th ed.). New York: Pearson.
- Kristanti, M. (2019). *Peran Koperasi dalam Menopang Sentra UMKM Perdesaan*. *Jurnal Ekonomi dan Koperasi*, 4(3), 88–102.
- Lestari, R., & Suryana, D. (2022). *Model Pemberdayaan UMKM melalui Sentra Terpadu di Kabupaten Banyumas*. *Jurnal Pengabdian dan Pemberdayaan Masyarakat*, 4(2), 103–117.
- Marshall, A. (1920). *Principles of Economics* (8th ed.). London: Macmillan.
- McKinsey & Company. (2021). *Digitalisasi di era baru: Transformasi digital untuk pertumbuhan bisnis*. McKinsey & Company.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). *Qualitative Data Analysis: A Methods Sourcebook* (4th ed.). Thousand Oaks, CA: SAGE Publications.
- Mubyarto. (2000). *Ekonomi Kerakyatan: Tujuan dan Implementasinya*. Jakarta: Penerbit X.
- Mulyani, E. (2018). *Kajian Ekonomi Lokal melalui Penguatan Sentra Batik di Pekalongan*. *Jurnal Kebudayaan dan Ekonomi Kreatif*, 2(2), 55–68.
- Mustika, R. (2020). *Dampak Sentra UMKM terhadap Pertumbuhan Ekonomi Lokal di Kota Medan*. Medan: Lembaga Penelitian Universitas Sumatera Utara.
- Nuraini, S. (2019). *Peran Pemerintah Daerah dalam Pengembangan Sentra Industri Kecil dan Menengah*. *Jurnal Administrasi Publik Indonesia*, 6(3), 79–91.
- Porter, M. E. (2019). *Competitive Advantage of Nations* (2nd ed.). New York: Free Press.
- Pranata, W. (2020). *Strategi Pengembangan UMKM Berbasis Digital di Sentra Kuliner Bandung*. *Jurnal Inovasi Digital dan Ekonomi Kreatif*, 3(1), 34– 50.
- Prasetyo, A. (2020). *Kolaborasi Triple Helix dalam Pengembangan Sentra UMKM di Yogyakarta*. *Jurnal Ilmu Sosial dan Inovasi*, 2(3), 119–133.
- Prasetyo, D. (2020). *Peran Masyarakat dalam Pengembangan Sentra UMKM di Wilayah Perkotaan*. Jakarta: Penerbit Universitas Indonesia.
- Priansa, D. (2018). *Manajemen Usaha Mikro, Kecil, dan Menengah (UMKM) untuk Peningkatan Daya Saing*. Bandung: Penerbit Alfabeta.
- Priyono, B. (2020). *Analisis Faktor-Faktor Pendukung dan Penghambat Pengembangan UMKM di Kota Medan*. Medan: Penerbit Universitas Sumatera Utara.
- Purnomo, S. (2020). *Strategi Pengembangan Usaha Mikro, Kecil, dan Menengah (UMKM) di Era Digital*. Jakarta: [MLA].
- Rahardjo, S. (2020). *Strategi Pemberdayaan Usaha Mikro, Kecil, dan Menengah (UMKM) di Indonesia*. Jakarta: Penerbit Gramedia
- Rizki, F. (2020). *Implementasi Model Inkubator Bisnis di Sentra UMKM Kabupaten Semarang*. *Jurnal Manajemen dan Inovasi*, 6(1), 41–55.

- Saputra, A. (2021). *Dampak Sentra Industri UMKM terhadap Penyerapan Tenaga Kerja Lokal*. *Jurnal Ekonomi Kerakyatan*, 7(2), 67–81.
- Tambunan, T. T. H. (2020). *Development of Small and Medium Enterprises in Developing Countries*. Singapore: Springer.
- Todaro, M. P., & Smith, S. C. (2015). *Economic Development* (12th ed.). Boston: Pearson.
- Triyono, A., & Hapsari, S. (2021). *Analisis Kesiapan UMKM dalam Menghadapi Ekonomi Digital di Sentra Kerajinan Jepara*. *Jurnal Teknologi dan UMKM*, 3(2), 74–90.
- Wibowo, D. (2021). *Pengaruh Infrastruktur terhadap Pertumbuhan UMKM di Sentra Industri Logam Ceper*. *Jurnal Ekonomi Infrastruktur*, 5(1), 15–28.
- Wicaksono, A. (2020). *Kontribusi Sektor UMKM terhadap PDB di Indonesia: Analisis Data Tahun 2020*. *Jurnal Ekonomi dan Pembangunan*, 15(1), 45-58.
- Wijaya, A. (2019). *Cluster-Based Development for MSMEs in Emerging Economies*. *Asian Economic Journal*, 33(4), 350–368.
- World Bank. (2020). *MSMEs and Economic Development*. Washington, DC: The World Bank.
- Yuliansyah, R. (2020). *Pengembangan Usaha Mikro, Kecil, dan Menengah (UMKM) di Era Modern*. Jakarta: [Penerbit].
- Zulaikha, S. (2020). *Model Pemasaran Digital untuk Meningkatkan Daya Saing UMKM*. Yogyakarta: Penerbit Andi.