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Strategies of women SMEs actors in advancing the Laweyan batik business: The analytic hierarchy process method

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Abstract

The COVID-19 pandemic poses unprecedented challenges for SMEs, particularly in technology adoption and workforce management. This study explores post-COVID-19 recovery strategies for Batik Laweyan women SMEs, focusing on business preferences and technology integration. The research was conducted by utilizing the Analytical Hierarchy Process (AHP) method, which prioritizes the main areas for development: information technology, financial capital, and labor quality. Women SME actors in the batik fashion business are the subjects of this study. The findings show that the ability of women SMEs in the Batik industry is more focused on gaining helpful knowledge related to access to business financing, taking advantage of opportunities, building networks with technology, and solving problems efficiently. This study provides valuable insights for policymakers and businesspeople who aim to support the development of women SMEs and improve the sustainability of Laweyan Batik SMEs in the post-COVID-19 pandemic.

Keywords: AHP, Batik Laweyan, SMEs women.

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1. Introduction

The economic, social, and environmental disruptions caused by the COVID-19 outbreak have challenged SMEs to ensure business continuity [1]. Small and medium businesses, known as SMEs, are the main support for the Indonesian economy. SMEs play a strategic role in the development of the Indonesian economy. The creative economy is closely linked to SMEs, contributing significantly to national development. This can be seen from their ability to increase the turnover of small communities with limited capital, absorb labor, and equalize development. SMEs have a high labor absorption capacity compared to larger businesses in Indonesia. According to the [Indonesian Chamber of Commerce and](#)

Industry (KADIN) [2], the number of SMEs in 2023 reached around 66 million, contributing 61% of Indonesia's GDP, equivalent to IDR 9,580 trillion, and absorbing around 117 million workers (97% of the total workforce).

The growth of SMEs in Indonesia was challenged when the COVID-19 outbreak hit Indonesia in 2020. This pandemic brought many changes in various aspects of life. The economic crisis resulting from the pandemic impacted the continuity of micro, small, and medium businesses, causing many workers to be laid off. The pandemic had economic, social, and political impacts on almost all countries, including Indonesia. According to Ke, et al. [3], geographically diversified customers reduced inventory efficiency during the pre-pandemic period but increased it during the pandemic. The pandemic changed people's consumption habits from offline to online, challenging SMEs to survive by selling online or on social media. During the pandemic, companies started online trading and conducting business activities online [4].

After the pandemic, the Indonesian economy began to enter a period of recovery and experienced significant improvements. However, SMEs face many challenges that must be overcome by all relevant stakeholders, including innovation and technology, digital literacy, productivity, legality or licensing, financing, branding and marketing, human resources, standardization and certification, equitable development, training, and facilitation. The government plays a crucial role in developing SMEs through the Creative Economy. Policies are needed to improve the long-term resilience of food systems to support sustainable development [5]. The policy has an impact on small businesses that have many manufacturing businesses that offer product-oriented services [6].

The creative economy combines creativity and ideas with science and technology in the business sector. The government promotes SMEs to become creative economy entrepreneurs, supporting the country's economy. In the creative economy, every business actor can contribute ideas, creativity, solutions, and technology. Challenges include competition from machine-made products, lack of government support, and incentives to market products [7]. Developing a creative economy concept can also encourage regions to play a role in its development. All regions in Indonesia, both district and provincial levels, have a competitive spirit in realizing a creative economy. Surakarta is one area that supports the creative economy program, with special attention to the sector. The number of MSMEs in Surakarta in 2020 reached 3,480 business units, an increase of 1.6% from the previous year. Surakarta has enormous potential in the creative economy sector, especially the fashion subsector, which significantly influences the economic growth of the creative industry. Surakarta is a city famous for batik and has potential for the trade sector. The development of the fashion sector in Surakarta is rapid, supported by the construction of fashion shopping centers, houses, boutiques, and related shows and events. The fashion subsector is a top priority for development, with the Surakarta City Government hoping it will encourage the growth of creative and innovative SMEs businesses.

Several previous studies have highlighted the significant contribution of women-owned businesses to the global and local economies. Women's businesses account for more than 25 percent of all businesses, and women-owned businesses in Asia are experiencing growth [8]. Increasing the number of women entrepreneurs is one of the government's current initiatives in realizing the vision of being a well-developed country with a competitive economy, sustainable revenue, and stable social structure as a multiracial country [9]. On the other hand, the representation of women entrepreneurs remains relatively low, attributed to factors such as low education levels and inadequate managerial skills [10].

SMEs are very important for regional economic growth, yet they encounter numerous development challenges. Local governments found several issues, including limited access to capital, minimal technology adoption, and labor quality concerns. Despite government intervention and stimulus programs, many MSMEs still have difficulty obtaining adequate capital. In today's digital era, technological skills are essential, yet many SMEs find technology integration challenging. Additionally, employment issues pose significant barriers. The government must implement policies that foster information technology development to enhance productivity and broaden the market reach for MSME products [11].

Connectivity technology has contributed to women's home-based business activities in England [12]. Cultural and gender dynamics can significantly impact the ability and readiness of SMEs, particularly women, to adopt and benefit from new technologies. Technology can boost SME growth and contribute to gender equality in developing countries Diaz-Arancibia, et al. [13]. Lingyan, et al. [14] found that women-owned enterprises are more impressively engaged in open innovation practices, mainly for market-related intentions, to compete with competitors and meet customer demands. Regarding the aspect of product marketing and services, SMEs should focus on overcoming their limitations in the adoption of information technology [15].

Small and medium businesses in the Surakarta fashion sub-sector are interesting to study, especially how to empower women entrepreneurs in post-COVID-19 conditions. Therefore, this paper examines the optimization of the development of Batik Laweyan MSMEs in the context of post-pandemic financial performance recovery based on the preferences of MSME actors by using an analytical approach to the process hierarchy.

2. Theoretical Background

This research focuses on the perspectives and preferences of MSMEs actors in making policies. The creative industry is a growing sector that contributes to the growth of gross domestic product (GDP) in the global economy and trade [16]. Several studies confirm that SMEs play an important role in developing the countries' economies in terms of increasing the GDP, creating new jobs and decreasing unemployment, and increasing the goods export and reducing the poverty [17]. Another result shows that there is a positive relationship between SMEs and increase in income level [18].

The COVID-19 pandemic surprised the well-growing economy in 2020, causing setbacks in all economic sectors such as tourism, aviation, and food [19]. The pandemic's impact varies depending on each company's market [20]. During the pandemic, MSMEs played an important role in the food supply chain, ensuring food and nutritional security [5]. The SME Covid-19 challenges included lockdowns restrictions, customer loss, lack of government support, and scarcity of raw

materials. The strategy implemented by SMEs to overcome this is to maintain a positive entrepreneurial mindset, reducing service prices [21]. The shocks forced entrepreneurs to carry out strategic planning and ongoing employee training to adopt technological demands [22].

The development of women's entrepreneurship has positive implications for societal and economic growth [23]. Women business founders provide an opportunity to determine their unique leadership characteristics. Starting a business may be a way for women business owners to be authentic and create more people-centered businesses. Female businesspeople often demonstrate a loving, servant leadership style characterized by calling, humility, trust, respect, self-development, stewardship, authenticity, and providing direction [24]. Women businesspeople contribute to trade and production, which not only generates personal income but also garners societal recognition [25]. Women empowerment is important for building adaptive capacity to climate change and enhancing family and community resilience, which is essential for community welfare improvement [26]. According to Goli, et al. [27], implementing policies that facilitate women in seeking livelihoods, training, and skills can effectively increase their empowerment. Business actors face challenges in adopting digital technology, accessing capital, and improving workforce quality. This challenge requires structured intervention and policy support from the government.

The pandemic caused MSMEs to experience financial shocks, requiring policies to overcome business financial problems Shui [28]. Escobar-Castillo, et al. [29] found that capital and knowledge management significantly affect innovation capability. According to Wiraguna, et al. [30] SMEs credit securitization plays a role in banking stability, showing a relationship between these variables. The technological transition increases SMEs' operational efficiency [31]. Business actors must understand technology use in their activities. Improving SMEs performance involves evaluating industrial human resource problems and providing solutions [32]. The establishment of microfinance has effectively provided financial services to people experiencing poverty and promoted gender equality. The findings [33] show four lines of study of inclusive credit programs: Poverty alleviation, credit for empowerment, financial inclusion policies, and microcredit outcomes. This is necessary to shape the structure of women's economic and social development as well as microfinance development.

According to Rodríguez, et al. [34] the AHP method presents many analytical advantages. The results obtained from the proposed AHP model should be interpreted, paying attention to the design of indicators and sub-indicators, and the priority assessment model should be carried out directly and efficiently. AHP method is of crucial importance for supporting the decision-making process in the field of technology management, especially when it comes to evaluation and selection of technological alternatives [35]. The improved AHP method can reduce personal judgment subjectivity, and its calculation process is compact and reasonable [36].

3. Research Method

Surakarta was chosen because of its prominent fashion industry, especially batik, which features many business actors and annual events. The Surakarta City Government emphasizes the development of Batik SMEs by addressing critical challenges such as capital, information technology, and social capital faced by creative economy-based SMEs. Primary data were collected through questionnaires and in-depth interviews with two expert respondents from the government and key informants consisting of four female SME actors with 1-8 years of business experience, four female SME actors with more than 10 years of business experience, and two from academia. The SME actors who became respondents had their collected data tabulated and averaged to obtain results.

The qualitative method approach used in this study, namely the Analytical Hierarchy Process (AHP). Data analysis in determining criteria and weighting to determine policies that are in accordance with the capabilities of SMEs. The AHP method helps prioritize various choices using multiple criteria. It is based on a structured and logical process. Prioritization is done through a logical and structured procedure [37]. The analysis tool used was AHP with Expert Choice software. After analysis, the output scores provided recommendations for the best development priorities for Laweyan Batik SMEs. The research was conducted in Surakarta, Central Java.

Steps taken for this analysis include:

1. Problem Identification
This step involves clearly defining the problem or decision that needs to be made. This sets the stage for the entire process.
2. Decision Hierarchy Construction
Break down the problem into a hierarchy of more easily comprehended sub-problems, each of which can be analyzed independently. Establish a broad perspective goal at the top of the decision hierarchy, gradually moving down to medium and lower levels.

Based on reliable literature observations and validated through interviews with experts critical of Laweyan Batik SMEs' development, the selected criteria include financial capital, information technology, and social capital. The AHP analysis method facilitates a priority list, filtering these categories into three priority indicators. The hierarchical structure includes:

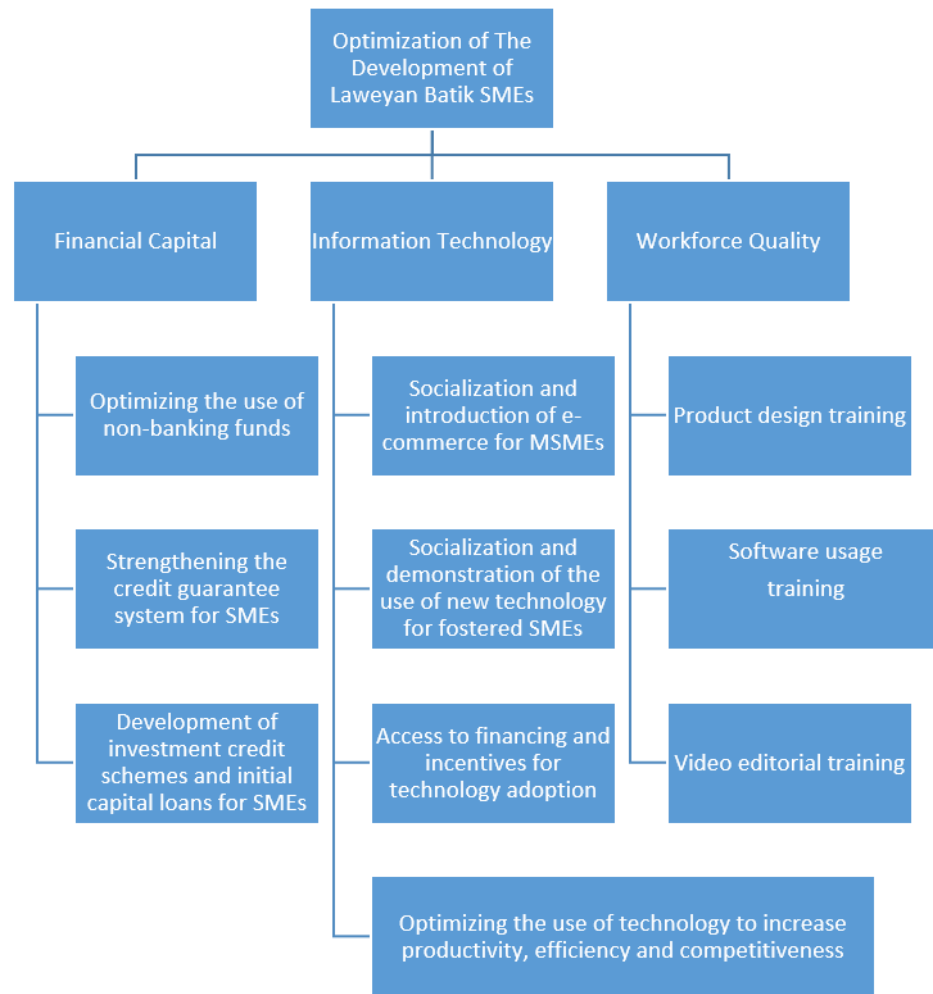


Figure 1.
Hierarchy of Optimizing SME Development.

1. Questionnaire distribution and interview assistance to respondents.
Researchers designed this questionnaire to include pairwise comparison questions important for assessing various criteria and alternatives. It was disseminated using the primary data collection method. A structured interview guide should be developed, encompassing all necessary questions and topics. During the interviews, it is crucial to assist participants in comprehending the questions and the comparison scale. Any uncertainties they express should be clarified to ensure the accuracy of their responses.
2. Priority Determination
This step involves calculating the relative importance of each element in the hierarchy based on the pairwise comparisons made by the respondents. Through the creation and filling of pairwise comparison matrices, elements are compared according to the criteria and alternatives formulated. Respondents can rate each element pair on a scale of 1 to 9 based on SME preferences.
3. Consistency Measurement and Decision Making
This step ensures that the pairwise comparisons made by respondents are reliable, using Eigenvalue Maximum as a consistency measure through the matrix itself with Expert Choice software.

Policies to improve the ability of SMEs to optimize performance to achieve welfare include: (1) Building partnerships between large companies and SMEs to help develop SMEs. Not only government entities but also private companies have a role in helping SMEs absorb their products. (2) SMEs need assistance in obtaining credit facilities from financial institutions and banks. (3) The government provides support to enhance the ability of SMEs to utilize digital technology in the production and marketing processes. (4) Improving internet access is necessary to enhance the ability of SMEs to market their products.

4. Results

Women's empowerment in social independence will increase along with the increase in wealth or income [38]. Women in UKM will gain social independence through self-empowerment. A key strategy for women to gain independence is to continually enhance their businesses, leading to growth and development. The government supports community empowerment, particularly for SMEs, by providing capital assistance and training to build capacity. Additionally,

partnerships between banking institutions and SMEs are essential to enhance SME capabilities, enabling them to grow and increase their income.

SMEs have many problems and require collaborative efforts to solve them. The government plays a pivotal role in enacting policies that bolster SME growth. Crucially, policies that foster collaboration among stakeholders in the innovation ecosystem and strategies that promote innovation investment in MSMEs in developing nations are indispensable [39]. Surakarta is a pioneer as a creative city in Indonesia, with the Blueprint for Creative Economy Development 2015-2025 since the launch of the creative economy concept. The analysis results show that optimizing productivity, efficiency, and competitiveness of batik in Laweyan District can be seen in the Table 1:

Table 1.
Alternative Priority Development for SMEs.

Alternative	Score	Order
Financial Capital	0.388	II
Information Technology	0.515	I
Quality of Workforce	0.097	III

Based on the table, the first priority is utilizing information technology. Information technology ranks first in optimizing the development of Laweyan Batik SMEs for post-pandemic financial performance recovery based on SME actor preferences. SME owners believe that social influence can encourage them to use e-money, a technology adoption that SME owners must master [40]. This shows the high awareness of digital transformation in facing modern business challenges. Key informants said, "We have to keep up with technological developments and consumer demand. Consumers now want everything to be practical and feel easier when they can buy and sell from home or pay using QRIS rather than cash." Meanwhile, academics stated, "If entrepreneurs do not keep up with technological developments, they will be left behind," while policymakers are prepared to provide facilities for entrepreneurs and consumers to continue to conduct buying and selling transactions through digital systems. MSMEs adopting technology such as AI can improve their performance in social, economic, and environmental sustainability [41].

The second priority is financial capital, an important resource for SME actors in managing their businesses. Financial capital serves as both a strength and a weakness, as initial capital is typically self-funded, followed by increases through loan funds. Several factors can make SMEs competitive in the market: the balance between technology and financial capital is very important, as well as the knowledge and quality of the workforce. Consequently, the third priority, derived from MSME actor preferences, is workforce quality.

Table 2.
Sub-Alternative Priority Information Technology.

Sub-Alternative Information Technology	Score	Order
Understanding e-commerce	0.457	I
Technology Utilization Demonstration	0.252	II
Access to Financing and Intensive	0.200	III
Technology Optimization	0.091	IV

Laweyan Batik SMEs must adapt to evolving customer paradigms over time. After formulating priority criteria, the sub-alternative priorities for leveraging information technology are: firstly, the adoption of e-commerce; secondly, demonstrating technology utilization; and thirdly, technology optimization, which involves enhancing the use of electronic devices. Zhu [41] stated that digital inclusive finance development significantly impacts labor income and improves financial service quality. Digital transformation is crucial for SMEs to achieve growth and competitiveness in local and global markets with strong government support [11].

SME actors, particularly those in operation for 1-10 years, heavily depend on technology for marketing their products. In contrast, SME actors who do not use e-commerce typically have been in business for over 10 years and have already built customer trust. Their marketing strategies were developed before the recent technological advancements. Nevertheless, these SMEs incorporate information technology into their operations, particularly as a risk management strategy in response to unforeseen events like pandemics. Utilizing information technology effectively can significantly increase order volume, revenue, production, and customer base. Optimal use of technology can provide great benefits to fashion businesses.

Table 3.
Sub-Alternative Financial Capital.

Sub Alternative Financial Capital	Score	Order
Optimization of Non-Bank Funds	0.582	I
Strengthening the Credit System	0.348	II
Investment Credit Scheme Development	0.069	III

Based on the preferences of SME actors, the top priority in financial capital sub-alternatives is optimizing non-bank funds, followed by strengthening credit systems and developing investment credit schemes. These recommendations are

aimed at policymakers and are based on the preferences of SME actors. Optimizing non-bank funds means SME actors can easily access and utilize non-bank funds, not only from revolving funds like the state or regional budgets but also from various programs such as state-owned enterprises providing partnership and development program funds [42], private companies providing corporate social responsibility (CSR) funds, and others. Based on the experience of key informants, the ease of accessing non-bank funding provides greater flexibility in managing business capital. Key informants said, "Access to non-bank funds can help solve our problems such as liquidity without having to go through lengthy banking procedures, so we can immediately respond to market opportunities and manage business cash flow more effectively." Shui [28] found that financial relief policies significantly impact SME financial problems. The government addresses SME financial problems through a development strategy based on the country's comparative advantages and development phase, which is key to reducing the SME financial gap. During the pandemic, macroeconomic conditions, monetary conditions, external conditions, global uncertainty, and risk premiums represent macroeconomic factors. The government must facilitate SMEs to access non-banking credit funds more easily. This urgency is stated in Law Number 20 of 2008 concerning SME Markets 7 and 8, which is the basis for expanding funding sources.

Table 4.

Sub Alternative Workforce Quality Score.

Sub Alternative Workforce Quality	Score	Order
Product Design Training	0.528	I
Software Training	0.333	II
Video Editorial Training	0.140	III

Respondents stated that they do not require special educational qualifications when recruiting employees. They typically seek high school graduates or those with diplomas for cashier roles. However, SME actors are keen for their employees to acquire additional technological skills. The key informant stated that "business success not only depends on employees' formal education, but also on employees' ability to adapt to the times and their desire to continue learning."

The first focus in improving workforce quality is product design training. Business actors must prioritize upgrading their employees' skills to keep pace with advancing technology Bintariningtyas, et al. [43]. Soluk, et al. [44] suggest that empirical support for mediation effects on SMEs is separate from HR capabilities or strategic planning capabilities. Second, software training. Third, video editing training. This aligns with research by Xiang, et al. [45] revealing that digital sensing ability, digital operation ability, and digital resource collaboration ability impact the entrepreneurial learning relationship. Not only ordinary workers can participate in digital literacy training for adopting information technology, but workers with disabilities can also participate in training to understand information technology [46]. This holistic approach helps ensure that all employees, regardless of their background or physical condition, can contribute optimally to the digital transformation of SMEs.

5. Discussion

The study highlights the critical areas for the development of Batik Laweyan women SMEs in the post-pandemic era. The optimization of Laweyan Batik SMEs development for post-pandemic financial performance recovery, based on SMEs actor preferences, prioritizes information technology by introducing e-commerce to entrepreneurs. The survival of business actors during crises or pandemics is influenced by motivational expectations, work effort expectations, and social influence [47]. Technological capability is essential for SMEs. Business actors need information technology for production, promotion, sales, and other activities. Demonstrating technology utilization can support sales, financing access, incentives for traders, and technology optimization. The second priority is financial capital, optimizing non-bank funds, strengthening credit systems, and developing investment credit schemes. Financing is crucial after information technology. The last priority is workforce quality, with activities such as product design training, software training, and video tutorials. The workforce must train themselves to keep up with technological advancements and understand information technology to develop SMEs. By focusing on these areas, SMEs can enhance their resilience, competitiveness, and overall performance.

In the context of empowering the MSME labor, female workers show a significant role in adopting technology and developing digital skills. Female workers have great potential in driving the digital transformation of MSMEs, especially in the aspects of design creativity and the use of social media for marketing [48]. The multitasking abilities that female workers generally have are also an added value in managing various digital platforms simultaneously, from marketplaces to social media, which ultimately contributes to increasing the competitiveness of MSMEs in the digital era [49]. The government can enhance digital training initiatives for female MSME participants by incorporating e-commerce platforms. The strategic role of collaboration between industry, society, government, and the media in developing compelling education and training programs is needed to empower women [50]. The women entrepreneurs at MSMEs Batik Laweyan prove that they can adapt to the demands of digitalization and choose technology as the main strategy to keep moving forward.

This is in line with the main priorities identified in this research, especially in digital marketing strategy. The research also highlights the significance of capital, suggesting that the government could introduce more accessible credit and funding options. These might include exclusive initiatives for women, such as the People's Business Loans (KUR), creative business grants, and partnerships with corporations for CSR initiatives. According to Zelu, et al. [51], in terms of formal and informal financial access and women's economic empowerment, women who have financial accounts are more likely to work and tend to have higher incomes.

Studies indicate that training in product design and technology substantially influences the sustainability of businesses. Therefore, the government is encouraged to tailor training programs to meet local demands, thereby fostering product innovation within the batik industry. Additionally, strategies to enhance collaborations between Micro Small Enterprises (MSEs) and Large Micro Enterprises (UMBs) could focus on technology transfer, market sharing, and cooperative efforts in supply chain management.

6. Conclusion

The development of Batik Laweyan SMEs, which has a female leader, shows that the use of information technology, capital, and improving the quality of labor are the top priorities in supporting the recovery of MSEs' financial performance after the pandemic. Women MSME actors show resilience in utilizing technology for marketing, production, and business efficiency to survive the COVID-19 pandemic. Government and stakeholder support is urgently needed to ensure access to adequate resources and create an inclusive business environment for women MSEs. Government policies in supporting women MSME actors can be carried out through collaboration between MSMEs and non-bank financial institutions and CSR programs from companies that support the performance of Batik Laweyan SMEs. The support of large companies can be an effective strategy to expand market access for Laweyan batik MSMEs. The recommendations provided aim to address the specific needs of SMEs, ensuring they have the necessary tools, resources, and support to thrive in a rapidly changing business environment. Government policies play a crucial role in facilitating this development, and targeted interventions can significantly impact the sustainability and growth of Batik Laweyan SMEs. By implementing these strategies, women SMEs in the Batik industry can overcome the challenges posed by the pandemic and continue to contribute significantly to the local and national economy.

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