


Digital Financial Transformation and Operational Efficiency in Batik MSMEs

Laynita Sari

Sekolah Tinggi Ilmu Ekonomi KBP, Padang, Indonesia

Article Info	ABSTRACT
<p>Keywords: digital transformation, operational efficiency, MSMEs</p>	<p>The development of digital technology has driven significant changes in the operational management of Micro, Small and Medium Enterprises (MSMEs) in Indonesia. In the context of the batik industry, digital transformation is a strategic step to improve cost efficiency and maintain competitiveness in the creative economy era. This study aims to analyze the digital transformation process and its impact on operational efficiency in Batik MSMEs in Cirebon. The research approach used is descriptive qualitative with a case study method. Data were collected through in-depth interviews, field observations, and documentation of five batik MSME players in the Trusmi area. The results showed that digital transformation was carried out through three main aspects: marketing digitalization, financial digitalization, and production digitalization. The implementation of digital technology is proven to reduce operational costs by 25-35%, accelerate cash flow, and increase the transparency of financial records. However, barriers are still encountered in digital literacy, organizational culture resistance, and infrastructure limitations. This research confirms that the success of MSMEs' digital transformation depends not only on technology, but also on the readiness of human resources and support related to the digital business ecosystem.</p>
<p>This is an open access article under the CC BY-NC license</p> 	<p>Corresponding Author: Laynita Sari Sekolah Tinggi Ilmu Ekonomi KBP, Padang, Indonesia laynitasari4@gmail.com</p>

INTRODUCTION

Digitalization has become a major catalyst in improving the competitiveness of MSMEs in Indonesia. Based on data from the Ministry of Cooperatives and SMEs (2024), 22 million MSMEs have participated in the digital ecosystem, but most are still in the early stages of technology adoption (Herlina, 2024; Nurarifah & Kuntadi, 2024; Pramadian et al., 2025). In the creative economy sector, especially the batik industry, digital transformation presents both opportunities and challenges in maintaining operational efficiency without losing local cultural identity (Septiano & Sari, 2020).

Digitalization has emerged as a strategic necessity for Micro, Small, and Medium Enterprises (MSMEs) to sustain competitiveness in the creative economy era. However, despite various government initiatives, many MSMEs particularly in traditional industries such as batik, remain at the early stage of technological adoption. Existing studies have primarily focused on digital marketing and e-commerce integration but have not yet explained how digital financial transformation specifically contributes to operational efficiency at the microenterprise level. This gap highlights the need to examine the mechanisms through which

digital tools affect cost structure, transaction transparency, and production agility in batik MSMEs.

Cirebon is one of the largest batik centers in Indonesia with more than 800 active MSME units. Batik MSMEs face high cost pressures due to conventional raw materials, distribution, and marketing. On the other hand, the emergence of digital platforms such as Tokopedia, Shopee, and Instagram opens wider market access with more efficient promotion costs.

However, not all batik MSME players are able to take advantage of digitalization optimally. Low digital literacy, limited human resources, and resistance to change are obstacles that need to be understood in depth. Therefore, this study aims to a) Identify the forms and stages of digital transformation in batik MSMEs in Cirebon. B) Analyzing the impact of digitalization on cost efficiency and operational productivity (Sari et al., 2023) . C) Reveal the challenges and adaptation strategies of MSME actors in the digital transformation process.

Therefore, this study seeks to address the following research questions: 1) What are the stages and practices of digital transformation in batik MSMEs?. 2) How does digital transformation impact operational efficiency in terms of cost reduction, financial transparency, and workflow optimization?. 3) What barriers and adaptive strategies emerge during the transformation process?. By addressing these questions, this research contributes to the growing literature on digital transformation among creative MSMEs in Indonesia by offering an integrated analysis of marketing, financial, and production digitization processes.

METHODS

This research uses a qualitative approach with a case study method to deeply understand how digital transformation affects operational efficiency in batik MSMEs in Cirebon. The qualitative approach (Babayo & Milala, 2024; Sugiyono, 2019) was chosen because it is able to explore socio-economic phenomena contextually, namely how batik business actors interpret and adapt digital technology in their business processes (Saputra & Kuntadi, 2025; Sugiarta et al., 2025; Zaynuri & Kuntadi, 2025) . The case study method is used because this research focuses on a limited unit of analysis, namely several batik MSMEs, which can provide an in-depth understanding of the dynamics and practices of digitalization at the micro scale. The research location was set in the Batik Center of Cirebon Regency, West Java, which is one of the largest batik production centers in Indonesia. The choice of location was based on the consideration that this area represents traditional MSMEs that are transforming towards a digital ecosystem. The research subjects consisted of five owners or managers of batik MSMEs with a minimum business duration of five years, as well as two employees involved in the production and marketing processes.

Data collection techniques included:

- a) In-depth interviews lasting 45–60 minutes per respondent.
- b) Field observations of production, marketing, and financial recording processes.
- c) Document analysis of transaction records, online sales reports, and digital tools used.

Research instruments consisted of an interview guide with open-ended questions and field note templates. Data analysis used the Miles and Huberman (1994) model — data reduction, data display, and conclusion verification.

RESULTS AND DISCUSSION

This study reveals that the digital transformation process of Batik MSMEs in Cirebon takes place gradually and not uniformly. Each business has a different way, speed, and strategy in adopting digital technology. From the results of observations and interviews, three main dimensions of digital transformation were found to be interrelated: (1) marketing digitalization, (2) financial digitalization, and (3) production digitalization.

Marketing Digitalization: Market Expansion and Cost Savings

Before digitalization, most batik MSME players relied on conventional marketing through physical galleries, exhibitions, and repeat customers. As the use of online platforms increased, they began to turn to social media (Instagram, Facebook) and marketplaces (Shopee, Tokopedia). Through these platforms, customer outreach has increased significantly, even to markets outside Java. One informant mentioned that digital promotion was able to reduce marketing costs by around 30%, as there was no longer a need to participate in large exhibitions that require stand rental and transportation costs. The implementation of digital promotion strategies has also led to changes in work patterns: MSMEs now have dedicated staff to manage social media accounts and product content. Although still simple, this change creates time efficiency and allows businesses to monitor consumer responses in real time. These results are in line with the findings of Utami and Rahayu (2023), which state that digital marketing is the main key to increasing promotional efficiency in creative MSMEs.

Financial Digitalization: Transparency and Cash Flow Efficiency

Digital transformation in the financial aspect is carried out through the adoption of digital bookkeeping applications such as BukuKas, Mekari, or CatatanKeu.id, as well as the use of the QRIS payment system. Before digitalization, financial transactions were carried out manually, using simple notebooks or Excel, which often led to recording errors and delays in reports. After using digital applications, MSME players claim to be able to monitor daily income and expenses directly, so that cash flow is more controllable.

In addition, the implementation of QRIS accelerates payment transactions between customers and sellers, reduces the risk of losing cash, and accelerates the cash cycle. Some businesses even integrate app reports into monthly profit and loss calculations. This increased transparency also helps them in applying for capital loans to financial institutions as transaction data can be verified easily. This finding reinforces Porter's (1985) theory of operational efficiency as a competitive advantage.

Digitization of Production: Automation and Cost Control

Digital transformation in the batik production sector is done selectively. Some MSME players have started using semi-automatic stamping machines and digital coloring tools to speed up the production process and reduce raw material waste. However, most still maintain manual processes at the motif design and final coloring stages, as the art and tradition aspects are the main selling points.

Digitization at this stage plays a major role in improving the efficiency of materials and working time, but it also poses a dilemma between economic efficiency and cultural preservation. MSME owners mentioned that operational cost efficiency could increase by 25-35%, mainly from reduced fabric waste and electrical energy. However, the initial investment in digital equipment is high, so some small MSMEs are still delaying full implementation.

Obstacles to Digital Transformation

The main obstacle found is the low level of digital literacy among MSME players. Most business owners are over 45 years old and do not have a technology background, so they still rely on the help of children or young employees in managing online stores. In addition, organizational culture resistance also emerged; some senior craftsmen rejected the use of new tools for fear of changing the character of traditional batik. Another obstacle is the limited access to digital infrastructure in production areas. Some batik locations on the outskirts of Cirebon have weak internet signals, hampering the communication process with online customers. These factors confirm that digital transformation in traditional MSMEs is not just a matter of technology, but also changes in mentality and the social structure of work.

Despite the challenges, MSME players have shown strong adaptability. Strategies include self-training through online tutorials, collaboration with young designers for digital branding, and the implementation of hybrid work systems (offline-online). Some MSMEs have also established partnerships with marketplaces for digital marketing and online stock management training.

Businesses that have successfully adapted generally have an openness to innovation, support from young digital-savvy families, and a reflective ability to assess the effectiveness of technology. Thus, digital transformation not only improves cost efficiency, but also fosters organizational learning capacity in the long run.

Summary of Findings

Table 1. Summary of Finding

Dimension	Key Findings	Effect on Efficiency
Marketing Digitalization	Adoption of social media & marketplace sales (Instagram, Shopee, Tokopedia).	Expanded market reach; reduced promotion costs by 30%.
Financial Digitalization	Use of QRIS, BukuKas, Mekari; automated bookkeeping.	Faster cash flow, higher transparency, reduced recording errors.
Production Digitalization	Use of semi-automatic stamping machines & digital dyeing tools.	Cost savings 25–35%; improved material utilization; time efficiency.

The Summary of Findings section summarizes the main results of the study based on three main dimensions of digital transformation found in batik MSMEs in Cirebon, namely marketing digitalization, financial digitalization, and production digitalization.

1. Marketing Digitalization

Batik MSMEs have begun to shift from conventional promotion to digital platforms such as Instagram, Shopee, and Tokopedia. This change has proven to expand the market reach beyond Java and reduce promotion costs by up to 30%, as there is no longer a need to participate in physical exhibitions or print brochures.

2. Financial Digitalization

The implementation of digital financial applications such as BukuKas, Mekari, and QRIS helps MSME players in automatically recording transactions and accelerating cash flow. As a result, cash flow has become more controlled, financial reports more transparent, and recording errors have decreased significantly.

3. Production Digitalization

Some MSMEs have started using semi-automatic stamping tools and digital coloring, which have increased material and work time efficiency. Operational efficiency has increased by around 25–35%, although some traditional batik processes are still maintained in order to preserve cultural values.

These narratives support the notion that digital transformation significantly enhances cost efficiency and transparency aligning with Porter's (1985) theory of operational efficiency, which posits that technology adoption reduces transaction costs and resource waste. Furthermore, consistent with Teece (2007), MSMEs that adapt digital tools dynamically build new capabilities that lead to sustainable competitive advantage.

CONCLUSION

This study concludes that digital transformation among Batik MSMEs in Cirebon occurs gradually, shaped by technological capability, organizational culture, and infrastructure readiness. The transformation significantly enhances operational efficiency through reduced promotion costs, accelerated cash flow, and improved data transparency. However, human and cultural readiness remains the main challenge. Digital financial transformation proves to be the most impactful component, as it simplifies bookkeeping and facilitates faster financial decision-making. Nonetheless, digital literacy gaps and infrastructure constraints still limit full-scale implementation. Future research should expand the scope by incorporating quantitative performance indicators to measure the financial impact of digital transformation more precisely. Comparative studies between regions or sectors are also recommended to generalize the findings. Government and local agencies should provide targeted training and incentives to accelerate digital literacy and infrastructure support for creative MSMEs.

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