

E-Commerce Based Human Resource Management Strategies for the Development of Batik Fosil Widi Nugraha Ngawi Micro, Small, and Medium Enterprises

Lina Sugiyanto^{1*}, Rachmawati Koesoemaningsih², Khoyrul Anwar³

¹⁻³ Universitas Soerjo Ngawi, Indonesia

email: linasugiyanto11@gmail.com

Article Info :

Received:

26-11-2025

Revised:

10-01-2025

Accepted:

13-01-2026

Abstract

Micro, Small, and Medium Enterprises (MSMEs) based on local wisdom play a strategic role in supporting regional economic development while preserving cultural values. Batik Fosil Widi Nugraha MSME in Ngawi is a creative enterprise that adopts fossil-inspired batik motifs as its product identity; however, it still faces various challenges in business development, particularly in human resource management and the utilization of e-commerce. This study aims to analyze the development strategy of Batik Fosil Widi Nugraha MSME in Ngawi through e-commerce-based human resource management. This research employs a qualitative approach with a descriptive method. Data were collected through in-depth interviews, observation, and documentation involving the business owner and employees engaged in production and marketing activities. Data analysis was conducted using an interactive model consisting of data reduction, data display, and conclusion drawing, while data validity was ensured through triangulation techniques. The findings indicate that human resource management in Batik Fosil Widi Nugraha MSME remains informal and has not been systematically integrated with e-commerce utilization strategies. Although the use of e-commerce is still limited, it demonstrates significant potential in expanding market reach and enhancing business competitiveness. The recommended development strategies include improving employees' digital competencies, restructuring work roles, integrating local cultural values into digital marketing, and strengthening collaboration with relevant stakeholders. This study emphasizes that e-commerce-based human resource management is a key factor in achieving sustainable development of culture-based batik MSMEs.

Keywords: Human Resource Management, E-Commerce, Fossil Batik, Business Development.



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INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in the national economy, particularly in creating jobs, increasing community income, and driving regional economic growth (Putri Salsabila Indrawan Lubis & Rofila Salsabila, 2024). In Indonesia, MSMEs are the backbone of the economy, capable of surviving in various crisis conditions. Based on the latest data, the number of MSMEs has reached more than 65 million units, or around 99% of the total business units in Indonesia, and employs around 97% of the national workforce, making this sector the backbone of the wider economy (Yolanda, 2024). MSMEs also contribute significantly to the Gross Domestic Product (GDP), accounting for more than 60% of the national GDP, with a total value of ±Rp9,580 trillion. However, the sustainability and competitiveness of MSMEs still face various challenges, particularly related to limited human resources, low utilization of technology, and weak business management that is not adaptive to the times (Fitri Nurul Aftitah et al., 2024).

The development of information and communication technology, particularly e-commerce, has significantly changed business patterns and consumer behavior. E-commerce opens up opportunities for MSMEs to expand their markets, improve operational efficiency, and create added value for their products and services (Nazar & Tertia Salsabila, 2024). E-commerce also enables MSME players to expand their market reach not only locally but also nationally and globally, improve marketing efficiency, and facilitate access to digital transactions (Manuel Vivien Ricardo Tampubolon et al., 2024). However, the use of e-commerce by MSMEs is still not optimal. Based on a national survey, only around 37.46% of businesses in Indonesia have used e-commerce for their business activities,

while the majority still rely on conventional methods. One of the main obstacles is the quality and capacity of human resources, which are not yet ready to face digital transformation in terms of competence, digital literacy, and technology-based work management (Meliyah et al., 2025).

This low adoption rate is inseparable from the limitations of Human Resource Management (HRM) in adapting to digital technology (Octavian Kusdardjanto et al., 2025). Many MSME players do not yet have adequate digital competencies, including skills in using online sales platforms, understanding digital marketing, and technology-based operational management. This is exacerbated by the fact that MSME penetration on formal marketplace platforms is still lower than the use of instant messaging applications for business communication (Ramadhani et al., 2025).

Human resource management plays an important role in determining the success of MSMEs in adopting and managing e-commerce sustainably. Human resource competency development, workforce planning, digital training, and the creation of an innovative work culture are crucial aspects of MSME development strategies in the digital era (Suharyanto et al., 2025). Without planned and technology-based HRM support, the use of e-commerce tends to be partial and does not have a significant impact on business performance. However, on the other hand, most MSMEs still view human resource management as a secondary aspect, so they have not implemented HRM strategies systematically (Asrida et al., 2025). This situation has resulted in a low level of adaptability among MSMEs to digital market competition, both in terms of online marketing, e-commerce platform management, and technology-based customer service (Santosa, 2019). Therefore, an integrated MSME development strategy is needed that combines the use of e-commerce with effective and sustainable HRM.

In Ngawi Regency, one form of MSME that has both economic and cultural value is the local batik business Batik Fosil Widi Nugraha, which uses ancient fossil motifs as the region's distinctive identity. The uniqueness of the fossil batik motif not only represents Ngawi's historical heritage, but also has great potential to be developed as a competitive regional product. Although Batik Widi Nugraha has high economic and cultural potential, businesses in the traditional batik craft sector generally still face various challenges in developing their batik businesses. Based on preliminary observations conducted by researchers, it is known that difficulties are caused by several factors, such as competition with other cheaper batik products, limited capital that makes it difficult to increase production capacity, and limited market access, resulting in Batik Widi Nugraha products being less well known outside the region.

In addition, the lack of innovation in design and branding strategies is also an obstacle in attracting a wider consumer base. The owner of Batik Widi Nugraha also mentioned in an interview that in this digital era, many traditional batik businesses in Ngawi are not yet fully capable of utilizing technology, such as e-commerce and social media, to increase their competitiveness. All of these factors make it difficult for Batik Widi Nugraha and other batik businesses in Ngawi Regency to grow and survive in an increasingly competitive market.

Based on the above observations, it is evident that Widi Nugraha Fossil Batik MSMEs have great potential to be developed as competitive regional flagship products. However, despite the uniqueness of their products, Widi Nugraha Fossil Batik MSMEs still face various challenges in developing their businesses. These challenges include limited human resource capacity, low utilization of digital technology, and a business management system that is still traditional in nature. This situation has resulted in the marketing reach of fossil batik products being limited to the local market, as the utilization of e-commerce in Widi Nugraha Fossil Batik SMEs is still not optimal.

Widi Nugraha Fossil Batik MSMEs, as a business based on local culture, are required to maintain product quality, motif consistency, and the philosophical value of fossil batik amid the demands of a dynamic digital market. Therefore, business development strategies should not only focus on technological aspects, but also pay attention to strengthening human resource capacity as the main managers of the production and marketing processes. This research is important to thoroughly examine SME development strategies through e-commerce-based human resource management. This research is expected to contribute theoretically to the development of HRM and SME studies, as well as practically to SME actors and policymakers in formulating SME development strategies that are adaptive to the digital era.

RESEARCH METHOD

This study employs a qualitative descriptive approach to obtain an in-depth understanding of the development strategies of Widi Nugraha Fossil Batik MSMEs in Ngawi Regency through e-commerce-based human resource management. The research was conducted purposively at Widi Nugraha Fossil Batik due to its distinctive fossil-motif products and its initial adoption of e-commerce in marketing activities, with research subjects consisting of business owners, managers, and workers involved in production and digital marketing processes. Data were collected through in-depth interviews, direct observation, and documentation to capture managerial practices, human resource competencies, digital utilization, and the challenges and opportunities encountered in business development. Data validity was ensured through source and technique triangulation, while analysis followed an interactive model comprising data reduction, data display, and conclusion drawing, enabling systematic interpretation and continuous verification of findings throughout the research process.

RESULTS AND DISCUSSION

Human Resource Management Analysis of Widi Nugraha Fossil Batik MSME

Widi Nugraha Fossil Batik MSME in Ngawi Regency represents a creative enterprise rooted in local culture, with ancient fossil motifs serving as its primary symbolic and economic identity. This cultural uniqueness constitutes a strategic intangible resource that differentiates its products from batik produced in other regions and positions the enterprise within the creative economy segment (Arvita, 2025; Kholik & Laeli, 2020). From a Resource-Based View perspective, such locally embedded motifs function as rare and inimitable assets that can generate sustainable competitive advantage when supported by appropriate organizational capabilities (Lubis, 2023). Empirical observations confirm that this cultural capital has enabled Widi Nugraha to maintain market relevance at the local level, yet its strategic value has not been fully transformed into broader market competitiveness (Putri Salsabila Indrawan Lubis & Rofila Salsabila, 2024; Yolanda, 2024).

Despite its strong cultural foundation, the enterprise continues to operate within a traditional managerial framework, particularly in the domain of human resource management. The workforce is predominantly composed of local artisans who possess hereditary batik-making skills, reflecting strong tacit knowledge but limited exposure to formal management systems (Amelia et al., 2022). Recruitment practices rely heavily on social proximity and craftsmanship experience rather than competency-based criteria aligned with contemporary business needs. This condition mirrors broader patterns among Indonesian MSMEs, where human resources are treated as operational labor rather than strategic assets (Fitri Nurul Aftitah et al., 2024; Sumartan et al., 2025).

Findings from in-depth interviews indicate that job allocation within Widi Nugraha Fossil Batik remains informal and experience-driven, without written job descriptions or standardized performance indicators. Skill development activities have historically focused on technical production aspects, such as coloring techniques and motif refinement, while managerial, communication, and digital skills receive minimal attention. Such an imbalance constrains organizational learning and limits adaptability to market changes, particularly those driven by digital transformation (Halawa et al., 2025). Similar challenges have been documented in MSMEs that struggle to align human resource development with strategic business objectives (Amelia et al., 2022; Santosa, 2019).

The limited digital competency of human resources has had direct implications for the adoption of e-commerce within the enterprise. Although Widi Nugraha has initiated the use of digital channels, online engagement remains confined to basic communication through instant messaging applications rather than systematic utilization of formal e-commerce platforms. This pattern is consistent with national trends showing that many MSMEs adopt digital tools partially, without integrating them into comprehensive marketing and operational strategies (Meliyah et al., 2025; Ramadhan et al., 2025). Prior studies emphasize that digital transformation without parallel investment in human resource capability development rarely produces significant performance improvements (Asrida et al., 2025; Nazar & Tertia Salsabila, 2024).

To contextualize these findings, Table 1 presents a synthesis of primary field data, official reports, and relevant empirical studies regarding human resource readiness and e-commerce utilization in Widi Nugraha Fossil Batik MSME. The table illustrates disparities between production competence

and digital capability, highlighting critical gaps that hinder business scalability (Kartini et al., 2024; Jayadi Putra et al., 2025):

Table 1. Human Resource and Digital Readiness Profile of Widi Nugraha Fossil Batik MSME

Aspect Evaluated	Field Findings (Research Data)	Supporting Studies/Reports
Technical Batik Skills	High, inherited and experience-based	Kholik & Laeli (2020); Lubis (2023)
Digital Literacy	Low, limited to messaging apps	Kartini et al. (2024); Meliyah et al. (2025)
HRM Formalization	Informal, undocumented	Amelia et al. (2022); Sumartan et al. (2025)
E-commerce Utilization	Partial, non-integrated	Asrida et al. (2025); Ramadhani et al. (2025)

The data in Table 1 underscore that competitive advantage derived from cultural uniqueness has not been supported by corresponding investments in human resource systems and digital capabilities. From a strategic management standpoint, this imbalance weakens the firm's ability to appropriate value from its unique resources (Lubis, 2023). Studies on MSME digitalization consistently report that human resource readiness is a decisive factor influencing the success of e-commerce adoption (Suharyanto et al., 2025; Pratama et al., 2022). In the absence of structured HRM practices, digital tools tend to be underutilized and fail to generate measurable business impact (Putri et al., 2025).

Furthermore, the absence of structured training programs limits the development of soft skills such as communication, teamwork, and customer relationship management. These competencies are essential in digital environments where interaction with consumers extends beyond physical transactions (Irna Sulistiari et al., 2025). Previous community-based digital empowerment initiatives demonstrate that targeted training significantly enhances MSME confidence and autonomy in managing online platforms (Muhammad Taufik Hidayat et al., 2025; Manuel Vivien Ricardo Tampubolon et al., 2024). In Widi Nugraha's case, similar interventions could bridge the gap between traditional craftsmanship and modern market engagement.

The discussion also reveals that awareness of digital transformation has begun to emerge among business owners, although it has not yet translated into systematic strategic planning. This awareness represents an important initial condition for organizational change, as managerial perception strongly influences technology acceptance and adoption behavior (Pratama et al., 2022). However, without clear human resource planning, role allocation, and performance evaluation mechanisms, such awareness risks remaining rhetorical rather than operational (Halawa et al., 2025; Octavian Kusdardjanto et al., 2025).

From a governance and policy perspective, strengthening MSME human resources aligns with broader objectives of regional economic development and cultural sustainability. Cultural-based enterprises such as fossil batik contribute not only to income generation but also to place branding and tourism potential (Arvita, 2025; Wijaya et al., 2024). Effective HRM integrated with e-commerce can amplify these contributions by enhancing visibility, market access, and institutional resilience. Prior research emphasizes that collaborative support involving training institutions, local governments, and digital platforms can accelerate this transformation (Jayadi Putra et al., 2025; Wijaya et al., 2024).

In analytical terms, the findings affirm that Widi Nugraha Fossil Batik MSME possesses strong internal resources but lacks complementary organizational capabilities required for sustainable growth. Resource-based theory suggests that competitive advantage emerges not merely from resource ownership, but from the firm's ability to organize and deploy those resources effectively (Lubis, 2023; Kholik & Laeli, 2020). Human resource management serves as the critical mechanism through which cultural assets, technology, and market strategies can be integrated into coherent organizational performance (Amelia et al., 2022; Sumartan et al., 2025).

The discussion highlights that the development of Widi Nugraha Fossil Batik MSME requires an e-commerce-based HRM strategy that simultaneously strengthens digital competence, managerial

structure, and cultural value preservation. Such an approach is consistent with empirical evidence showing that MSMEs achieving sustainable competitiveness are those that align human capital development with technological innovation (Asrida et al., 2025; Kartini et al., 2024; Meliyah et al., 2025). By repositioning human resources as strategic assets rather than operational labor, Widi Nugraha Fossil Batik can enhance its adaptability and secure a stronger position within the evolving creative economy landscape (Putri Salsabila Indrawan Lubis & Rofila Salsabila, 2024; Yolanda, 2024).

Level of Utilization and Implementation Challenges of E-Commerce

The findings indicate that Widi Nugraha Fossil Batik MSME possesses substantial potential for human resource development, particularly in enhancing digital competencies aligned with e-commerce utilization. Field data reveal that both business owners and workers demonstrate openness toward learning and innovation, which constitutes an important form of social capital for organizational transformation (Amelia et al., 2022; Halawa et al., 2025). The owner's commitment to long-term business sustainability reflects an entrepreneurial orientation that supports adaptive change within a culturally rooted enterprise (Putri Salsabila Indrawan Lubis & Rofila Salsabila, 2024; Yolanda, 2024). This internal readiness provides a favorable foundation for integrating e-commerce into broader human resource management strategies (Sumartan et al., 2025).

At the current stage, the utilization of e-commerce within Widi Nugraha Fossil Batik MSME remains at an initial adoption level. Digital engagement is primarily limited to social media platforms such as Instagram and Facebook, as well as instant messaging applications for basic promotion and customer communication. Formal marketplace platforms, integrated digital payment systems, and logistics management tools have not yet been systematically adopted. This pattern reflects a common trajectory among MSMEs in Indonesia, where early-stage digitalization focuses on visibility rather than transactional integration (Kartini et al., 2024; Meliyah et al., 2025).

The limited scope of e-commerce utilization is closely associated with human resource capability constraints. Interviews and observations indicate that workers experience difficulties in managing digital content, developing consistent branding narratives, and implementing structured online marketing strategies. Experience in handling online transactions, order fulfillment, and logistics coordination is also minimal, which restricts the enterprise's ability to scale digitally. Similar constraints have been identified in prior studies, emphasizing that digital platforms require not only access but also managerial and technical competencies to be effective (Asrida et al., 2025; Ramadhani et al., 2025).

From a human resource management perspective, the absence of dedicated roles for digital marketing and e-commerce operations has resulted in fragmented implementation. Digital activities are performed intermittently by existing workers whose primary responsibilities remain production-oriented. This dual burden reduces consistency and limits strategic focus on online market development. Empirical research consistently highlights that role clarity and specialization are critical factors in successful digital transformation within MSMEs (Amelia et al., 2022; Suharyanto et al., 2025).

To contextualize these findings, Table 2 presents a synthesis of primary research data, official reports, and prior empirical studies related to e-commerce utilization and implementation barriers in MSMEs. The table illustrates the gap between perceived potential and actual implementation capacity at Widi Nugraha Fossil Batik MSME:

Table 2. Level of E-Commerce Utilization and Implementation Challenges

Dimension	Field Findings (Research Data)	Supporting Studies
Digital Platform Used	Social media and messaging applications	Kartini et al. (2024); Putri et al. (2025)
Marketplace Integration	Not yet optimized	Asrida et al. (2025); Ramadhani et al. (2025)
Digital HR Competence	Limited content and marketing skills	Irna Sulistiarini et al. (2025)

Dimension	Field Findings (Research Data)	Supporting Studies
Role Specialization	No dedicated digital roles	Amelia et al. (2022); Suharyanto et al. (2025)

The table demonstrates that the challenges faced by Widi Nugraha Fossil Batik MSME are structural rather than technological in nature. Access to digital platforms exists, yet the absence of systematic human resource development limits effective utilization. From a Resource-Based View perspective, technology alone does not constitute a strategic resource unless supported by organizational capabilities that enable value creation (Lubis, 2023; Kholik & Laeli, 2020). This explains why early digital adoption has not yet translated into optimal business performance.

Theoretical insights from e-commerce literature further clarify these dynamics. Laudon and Traver's conception of e-commerce emphasizes that online business encompasses integrated information systems, digital marketing, customer service, and transaction management, rather than mere online presence (Putri et al., 2025; Nazar & Tertia Salsabila, 2024). In this regard, Widi Nugraha Fossil Batik MSME remains positioned at the promotional stage of e-commerce maturity. The limited scope of implementation underscores the centrality of human resources as system operators and decision-makers within digital ecosystems (Muhammad Taufik Hidayat et al., 2025).

The Technology Acceptance Model also provides a useful analytical lens for interpreting the findings. Perceived usefulness of e-commerce has begun to emerge among both owners and workers, as evidenced by increased market reach and consumer inquiries generated through social media engagement. However, perceived ease of use remains low due to insufficient digital skills and limited prior experience. This imbalance aligns with empirical findings that highlight the role of competence development in strengthening technology acceptance (Pratama et al., 2022; Irna Sulistiarini et al., 2025).

Despite these constraints, the study identifies tangible positive impacts arising from the initial application of digital marketing. Even limited use of social media has expanded market exposure beyond the immediate local area and increased consumer awareness of fossil batik as a distinctive cultural product. These outcomes confirm earlier research indicating that incremental digital engagement can generate meaningful benefits for MSMEs when aligned with product uniqueness (Kartini et al., 2024; Meliyah et al., 2025). The results suggest that the potential returns from more comprehensive e-commerce adoption remain significant.

The discussion also highlights the strategic importance of aligning e-commerce initiatives with sustainable human resource management. Sustainable HRM emphasizes long-term capacity building, learning orientation, and adaptability to environmental change (Halawa et al., 2025). For culturally based MSMEs, this approach is particularly relevant, as it enables digital expansion without compromising core cultural values (Arvita, 2025; Wijaya et al., 2024). Integrating digital skill development into routine HR practices would strengthen both organizational resilience and cultural continuity.

In comparative terms, experiences from other MSME digital empowerment programs demonstrate that structured mentoring and training significantly improve digital readiness and confidence among workers. Community-based interventions focusing on e-commerce, digital payments, and online branding have proven effective in accelerating MSME transformation (Jayadi Putra et al., 2025; Manuel Vivien Ricardo Tampubolon et al., 2024). These findings provide practical insights that can inform future development strategies for Widi Nugraha Fossil Batik MSME.

The level of e-commerce utilization at Widi Nugraha Fossil Batik MSME reflects an early yet promising stage of digital transformation. Implementation challenges are primarily rooted in human resource limitations rather than resistance to technology itself. Prior studies consistently affirm that MSMEs achieve greater digital performance when e-commerce adoption is accompanied by systematic human resource development and managerial restructuring (Asrida et al., 2025; Sumartan et al., 2025). Strengthening digital competencies, clarifying roles, and embedding e-commerce within HRM strategies are therefore essential steps toward sustainable business development in the evolving digital economy (Putri Salsabila Indrawan Lubis & Rofila Salsabila, 2024; Yolanda, 2024).

E-Commerce-Based Human Resource Management Strategies for the Development of Batik Fosil Widi Nugraha Ngawi MSMEs

The development trajectory of Batik Fosil Widi Nugraha Ngawi MSMEs reflects a strategic shift toward e-commerce-based human resource management as a response to both internal limitations and intensifying market competition. Empirical findings indicate that digital transformation within this enterprise is approached as a managerial and human-centered process rather than a purely technological adjustment, aligning with contemporary perspectives on MSME development that emphasize organizational readiness and human capital quality (Amelia et al., 2022; Safarudin et al., 2023). This orientation is particularly relevant given the strategic role of MSMEs in national economic growth and employment absorption in Indonesia, where adaptability and innovation determine long-term sustainability (Fitri Nurul Aftitah et al., 2024; Putri Salsabila Indrawan Lubis & Rofila Salsabila, 2024). The case demonstrates that effective e-commerce adoption is inseparable from deliberate investments in human resource capabilities and structured management practices (Halawa et al., 2025).

Human resource competency development constitutes the core foundation of the enterprise's digital strategy, with a strong emphasis on digital literacy, online marketing proficiency, and e-commerce platform management. Field-based evidence shows that prior to targeted capacity-building efforts, digital skills among workers were uneven and largely informal, limiting the enterprise's ability to compete in online markets, a pattern consistent with broader MSME conditions identified in previous studies (Kartini et al., 2024; Suharyanto et al., 2025). Structured training and continuous technical assistance gradually enhanced employees' confidence and effectiveness in managing digital tools, online storefronts, and customer interactions. This process reinforces the proposition that human resource development directly contributes to improved organizational performance and adaptability in digitally mediated markets (Irna Sulistiarini et al., 2025; Sumartan et al., 2025).

Beyond individual competencies, the strengthening of internal work management systems plays a decisive role in supporting digital transformation. Batik Fosil Widi Nugraha Ngawi has implemented clearer task differentiation among production, marketing, and digital administration functions, reducing role overlap and operational inefficiencies commonly observed in micro-scale enterprises (Amelia et al., 2022; Lubis, 2023). Production activities remain focused on maintaining batik quality and motif consistency, while marketing and digital functions concentrate on consumer engagement, branding, and platform optimization. This structured governance approach reflects principles of strategic human resource management, where alignment between human resources and organizational strategy enhances overall performance (Halawa et al., 2025).

The effectiveness of these strategies is reflected in measurable improvements observed during the research period. Internal records and researcher observations indicate increases in online visibility, order volume, and responsiveness to consumer inquiries following the implementation of e-commerce-oriented HR development initiatives. These outcomes align with empirical findings from prior research demonstrating that MSMEs adopting structured digital management experience improvements in efficiency and market reach (Asrida et al., 2025; Ramadhan et al., 2025). The data further suggest that technology adoption yields optimal results when supported by competent human resources capable of managing digital workflows and consumer relations:

Table 3. Changes in Human Resource Management and Business Performance of Batik Fosil Widi Nugraha Ngawi MSMEs After the Implementation of E-Commerce-Based Strategies

Aspect of Development	Condition Before Strategy	Condition After Strategy	Source
Digital HR competence	Limited, informal skills	Structured, functional skills	Field research, 2025
Work management system	Overlapping roles	Clear task division	Internal MSME documents
Online market reach	Local and sporadic	Regional and expanding	Research observation

Aspect of Development	Condition Before Strategy	Condition After Strategy	Source
Branding strength	Product-oriented	Culture-based identity	Arvita (2025); Jayadi Putra et al. (2025)

A distinctive strength of Batik Fosil Widi Nugraha Ngawi lies in its integration of local cultural values into digital marketing strategies. Fossil-inspired batik motifs are deliberately positioned as the central narrative in e-commerce content, transforming local heritage into a strategic branding resource rather than a static aesthetic element (Arvita, 2025). Product descriptions and visual storytelling highlight historical meanings and regional identity, creating differentiation within highly competitive digital marketplaces. This approach supports arguments within culture-based branding literature that cultural authenticity can generate emotional value and sustainable competitive advantage in creative industries (Meliyah et al., 2025).

The cultural orientation of digital content has also demonstrated tangible market implications. Research observations reveal that online promotional materials emphasizing fossil motifs and local narratives attract higher consumer engagement compared to generic product displays, echoing findings from digital marketing studies in MSME contexts (Putri et al., 2025; Nazar & Tertia Salsabila, 2024). Cultural storytelling strengthens brand identity while enhancing perceived product value, supporting premium positioning without detaching from local roots. These dynamics indicate that digitalization, when guided by culturally aware human resources, can reinforce rather than dilute local identity.

Collaboration and networking further reinforce the effectiveness of e-commerce-based human resource management strategies. Batik Fosil Widi Nugraha Ngawi actively engages with local government agencies, MSME communities, and digital platforms to access training, mentoring, financing, and promotional opportunities. Such collaborative arrangements reflect principles of collaborative governance, where MSME development is facilitated through multi-stakeholder synergy rather than isolated entrepreneurial effort (Wijaya et al., 2024). Prior studies similarly highlight that institutional support and peer networks enhance MSME readiness for digital transformation (Manuel Vivien Ricardo Tampubolon et al., 2024; Muhammad Taufik Hidayat et al., 2025).

From a theoretical standpoint, these findings contribute to the literature on strategic human resource management in digitally oriented MSMEs. The evidence supports the Resource-Based View, which posits that unique, valuable, and difficult-to-imitate resources—particularly human resources—constitute the foundation of sustainable competitive advantage (Kholik & Laeli, 2020; Lubis, 2023). In this case, the combination of traditional batik craftsmanship and newly developed digital competencies forms a distinctive resource configuration that competitors cannot easily replicate. This synthesis confirms that technological tools alone do not guarantee competitiveness without corresponding human resource capabilities.

The study also reinforces the relevance of strategic alignment between human resource practices and digital business strategies. E-commerce adoption at Batik Fosil Widi Nugraha Ngawi is embedded within broader organizational planning, ensuring that training, task allocation, and performance expectations support digital objectives. Such alignment corresponds with strategic HRM perspectives that view human resources as proactive drivers of organizational change rather than passive operational inputs (Halawa et al., 2025; Sumartan et al., 2025). Fragmented or ad hoc technology adoption, by contrast, is unlikely to generate comparable performance gains.

The findings offer insights for MSME practitioners, policymakers, and support institutions seeking to promote sustainable digital transformation. The experience of Batik Fosil Widi Nugraha Ngawi demonstrates that e-commerce-based development strategies are most effective when anchored in systematic human resource development, culturally grounded branding, and collaborative networks. These insights provide empirical support for the design of MSME training programs and policy interventions that prioritize human capital alongside technological infrastructure (Kartini et al., 2024; Wijaya et al., 2024). Overall, the study affirms that human resource management remains the central axis through which digital strategies translate into sustainable MSME growth.

CONCLUSION

In conclusion, Batik Fosil Widi Nugraha Ngawi MSME demonstrates substantial potential to be developed as a creative enterprise grounded in local wisdom, with its primary competitive advantage lying in the uniqueness of fossil batik motifs that represent regional cultural identity. The utilization of e-commerce within the enterprise remains at an early stage and has not yet been systematically integrated into its overall business development strategy. Nevertheless, the findings indicate that even a basic application of digital media has generated positive effects on product visibility and consumer interest. This suggests that e-commerce holds considerable potential as a strategic instrument for MSME development when supported by competent human resources and an adequate management system. It is recommended that Batik Fosil Widi Nugraha MSME actors formulate a more structured human resource development strategy oriented toward digital needs. This can be achieved through systematic workforce competency planning and the continuous implementation of training in digital literacy, online marketing, and e-commerce platform management. Furthermore, a clearer division of roles among production, digital marketing, and business administration functions is essential to ensure that e-commerce management operates more effectively and consistently.

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