

Human Resource Development Strategies in Facing the Industrial Revolution 4.0 among SMEs in Jambi City

Reki Bopi^{1*}, Ermaini², Arniwita Sy³

^{1,2,3}Universitas Muhammadiyah Jambi, Jambi, Indonesia

*Corresponding author email: rekiindra92454@gmail.com

Abstract

The era of the Industrial Revolution 4.0 has brought significant transformations in work systems and business management, including in the Micro, Small, and Medium Enterprises (MSMEs) sector, which serves as a key pillar of Indonesia's economy. This study aims to analyze human resource (HR) development strategies among MSMEs in Jambi City in addressing the challenges of Industry 4.0. This research employs a descriptive qualitative approach using purposive sampling techniques. The informants consist of MSME owners, employees, and representatives from the Office of Cooperatives and MSMEs of Jambi City. Data were collected through in-depth interviews, observations, documentation, and literature review. The findings reveal that most MSMEs in Jambi City have begun to implement HR development strategies through internal training programs, collaboration with government institutions, enhancement of digital literacy, and the development of employees' soft skills. However, several challenges persist, including limited technological knowledge, insufficient training funds, and the lack of continuous mentoring programs. Furthermore, HR development efforts have shown a positive impact on increasing productivity, improving operational efficiency, and strengthening the competitiveness of MSMEs in the digital era. This study concludes that technology-based HR development and cross-sector collaboration are critical factors in enhancing the competitiveness of MSMEs in Jambi City in the era of Industry 4.0.

Keywords: Human Resource Development, Industrial Revolution 4.0, Digital Literacy

This is an open access article under the CC-BY-SA license



1. Introduction

The Industrial Revolution 4.0 has brought significant changes to various aspects of human life, including the economic sector and the world of work. The advancement of digital technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Big Data, and automation systems has transformed the way people work, interact, and manage businesses. For business actors, these changes require a high level of adaptability in order to survive in increasingly intense global competition (Akbar, 2021).

In Indonesia, the Micro, Small, and Medium Enterprises (MSMEs) sector plays a vital role in supporting the national economy. According to data from the Ministry of Cooperatives and SMEs (2023), MSMEs contribute more than 60% to the Gross Domestic Product (GDP) and absorb approximately 97% of the national workforce (Roudhotun et al., 2024). Despite this significant contribution, many MSMEs still face serious challenges, particularly in terms of technological mastery, low digital literacy, and limited human resource (HR) managerial capabilities (Ilfi et al., 2023).

Jambi City, as one of the economic growth centers in Jambi Province, has considerable potential through various MSME sectors such as culinary businesses, handicrafts, and creative services. However, most MSME actors in Jambi City have not fully utilized digital technology to develop their businesses. Limited training opportunities, insufficient understanding of technology, and lack of HR development support have hindered MSMEs from achieving optimal transformation in the era of the Industrial Revolution 4.0 (Wulandari et al., 2024).

Human resources are a key asset of any organization and play a crucial role in achieving organizational goals. HR functions not only as labor but also as a driver of innovation and value creation. Human resource development is a continuous process aimed at enhancing individual capabilities to adapt to job demands and environmental changes. In the context of MSMEs, HR development is a key factor in improving productivity, creativity, and business competitiveness (Pahira et al., 2023).

Human Capital Theory emphasizes that investment in education and training leads to improved individual capabilities, which directly impact organizational productivity. This perspective aligns with the view that HR

development should encompass not only technical training but also the development of soft skills such as communication, innovation, and teamwork (Utami et al., 2024).

Previous studies have highlighted the importance of HR development in strengthening MSME competitiveness. Rahayu (2021) found that technology-based training can improve work efficiency and expand market reach through digitalization (Susilowati et al., 2025). Other studies emphasize the importance of collaboration between government, educational institutions, and MSME actors in building innovation-based human resource capacity. Furthermore, sustainable HR development has been shown to significantly enhance productivity and performance in small and medium enterprises (Hendra et al., 2024).

The Industrial Revolution 4.0 also has important implications for human resource practices. Technological changes require individuals to think more adaptively, analytically, and innovatively. Digital transformation is not only about adopting technology but also involves changes in mindset, organizational culture, and HR management strategies oriented toward competitive advantage (Djaini et al., 2025).

Therefore, HR development in MSMEs in the era of Industry 4.0 should not only focus on mastering digital technologies but also on fostering adaptive, creative, and collaborative characteristics. Well-planned HR development strategies will strengthen MSME actors' ability to face challenges while taking advantage of opportunities in the digital era.

Accordingly, this study focuses on analyzing HR development strategies among MSMEs in Jambi City, identifying the challenges and opportunities faced, and providing strategic recommendations to enhance productivity and business competitiveness (Indah, 2025).

The objectives of this study are: 1) To analyze human resource development strategies in MSMEs in Jambi City in facing the Industrial Revolution 4.0. 2) To identify challenges and opportunities for human resource development in the MSME sector in Jambi City. 3) To provide strategic recommendations for human resource development oriented towards increasing the productivity and competitiveness of MSMEs in the digital era.

2. Materials and Methods

This study employed a descriptive qualitative approach. This approach was chosen because the study aimed to deeply understand the human resource (HR) development strategies of Micro, Small, and Medium Enterprises (MSMEs) in Jambi City in facing the challenges of the Industrial Revolution 4.0. The sampling technique used in this study was purposive sampling, a technique based on specific considerations. The number of participants was determined based on the relevance and ability of the informants to provide information relevant to the research focus. In qualitative research, the term "sample" is replaced by "participant" or "informant," as the focus is on the depth of information, not the number of respondents.

The informants in this study consisted of: 1) MSME owners or managers (5 people), 2) Employees or operational staff (10 people), and 3) Representatives from the Jambi City Cooperatives and MSMEs Office (2 people). This number of informants was chosen because it was considered capable of providing a comprehensive perspective on the strategies, challenges, and impacts of HR development in the digital era.

2.1. Data Collection Techniques

In this study, the data collection techniques used included: 1) Observation, conducted directly with MSMEs in Jambi City to determine the human resource development process, work patterns, and the application of technology in operational activities. 2) In-depth interviews with key informants to obtain qualitative and exploratory data regarding human resource development strategies and policies. 3) Documentation, conducted by collecting various supporting documents such as training data, MSME activity reports, and information from relevant local government agencies. 4) Literature review, conducted by reviewing various literature, books, scientific journals, and previous research results relevant to the research topic, to strengthen the theoretical basis and data analysis.

2.2. Data Validation Techniques

This study employed data validity techniques through triangulation, as proposed by Sugiyono (2009), who stated that there are four types of triangulation as data validity checks: source, method, investigator, and theory triangulation. This study employed source triangulation, which involves comparing and cross-checking information obtained at different times and using different tools. The steps for source triangulation in this study include: 1) Comparing observational data with interview data. 2) Comparing information obtained from internal MSME sources with data from external parties, such as the Jambi City Cooperatives and MSMEs Office. 3) Comparing interview results with documents and written notes related to HR development strategies.

Through this triangulation technique, it is hoped that the data obtained will have a high level of validity and reliability, so that the research results can reflect the actual conditions in the field.

2.3. Data Analysis Techniques

Data analysis in this study was conducted using a descriptive qualitative approach, systematically and factually describing the phenomena found in the field. The data analysis steps refer to the Miles and Huberman (1994) model, which includes three stages: 1) Data Reduction: selecting and simplifying data from interviews, observations, and documentation according to the research focus. 2) Data Display: presenting the results of data reduction in narrative and tabular form to facilitate interpretation. 3) Conclusion Drawing/Verification: drawing conclusions based on patterns and relationships between findings, then verifying them with data triangulation.

2.4. Research Procedures

The steps in implementing this research include: 1) Preparation Stage: conducting a preliminary study, determining the research focus, and preparing interview guidelines. 2) Data Collection Stage: conducting observations, interviews, and documentation at the research location. 3) Analysis Stage: Data reduction, presentation, and drawing conclusions from the data obtained. 4) Compilation Stage: Reporting the research results in the form of a scientific journal following an academic format.

3. Results and Discussion

Jambi City is one of the economic centers in Jambi Province, with a rapidly growing Micro, Small, and Medium Enterprises (MSMEs) sector. According to data from the Jambi City Cooperatives and MSMEs Office (2024), the number of registered MSMEs reached approximately 32,000, spanning the culinary, crafts, fashion, and creative services sectors.

Most MSMEs in Jambi City still rely on conventional work systems, but they are starting to show an increase in the adoption of digital technologies such as the use of social media for promotions, digital cashier systems, and e-commerce platforms. This situation provides an important basis for assessing how human resource development strategies are implemented to adapt to the demands of the Industrial Revolution 4.0.

3.1. Results

Based on in-depth interviews and observations of MSMEs in Jambi City, several key findings emerged regarding human resource development strategies, the challenges they face, and their impact on business sustainability.

3.1.1. Human Resource Development Strategies Implemented by MSMEs in Jambi City

Interviews with MSME owners and employees revealed that most business owners have begun to recognize the importance of improving human resource competencies in the digital era. The strategies implemented include: 1) Internal Training and Coaching. Several MSMEs, particularly in the culinary and fashion sectors, regularly hold internal training focused on improving production skills, customer service, and digital marketing. The training is conducted in a simple manner, such as experience sharing sessions and hands-on practice. 2) Collaboration with the Government and Business Community. The Jambi City Cooperatives and MSMEs Office regularly holds training on digital marketing, application-based financial reporting, and e-commerce. This collaboration helps MSMEs understand the basics of technology use and modern business management. 3) Improving Digital Literacy and Technology Adaptation. Some MSMEs have begun implementing simple technologies such as Point of Sale (POS) systems, financial recording applications, and online buying and selling platforms like Tokopedia, Shopee, or TikTok Shop. 4) Employee Soft Skills Development. In addition to technical skills, MSMEs are also beginning to focus on developing interpersonal skills such as communication, discipline, and teamwork. This is crucial for improving efficiency and coordination in business activities.

3.1.2. Challenges to Human Resource Development in MSMEs in Jambi City

Despite the implementation of human resource development strategies, MSMEs face several challenges, including: 1) Limited Technological Knowledge. Many MSMEs still struggle to understand the use of digital technology. This limitation is caused by a lack of formal education in technology and limited experience in using digital devices. 2) Limited Funds and Time for Training. Because most MSMEs are small-scale, available funds are focused primarily on production and operations. This often results in delayed or discontinued training and human resource development programs. 3) Lack of Ongoing Mentoring. Government-organized training is often short-term and does not provide follow-up support, resulting in suboptimal implementation in the field. 4) Resistance to Change. Some MSMEs still maintain a traditional mindset and are reluctant to switch to digital systems, considering them complicated and risky.

3.1.3. Impact of Human Resource Development on MSME Performance and Competitiveness

Based on interviews and observations, the human resource development strategies implemented, although limited, have had a positive impact on improving MSME performance, including: 1) Increased Operational Efficiency: The implementation of simple technology such as financial recording applications and digital cashiers speeds up transaction processes and reduces manual errors. 2) Increased Market Competitiveness: MSMEs with digital literacy are able to expand their marketing reach through social media and e-commerce platforms. 3) Improved Service Quality: Employees who receive soft skills training demonstrate improvements in customer service and teamwork.

3.2. Discussion

The results of this study align with Human Capital Theory (Becker, 1993), which states that investment in human resource development, both through training and education, can increase organizational productivity and competitiveness. In the context of MSMEs in Jambi City, training and improving digital literacy have been shown to help businesses adapt to technological change.

Furthermore, these results reinforce Vial's (2019) view in the Digital Transformation Framework, which states that the success of digital transformation is determined not only by technology but also by human resource readiness in managing it. MSMEs with human resources that are adaptive to technology will be better able to compete in the modern marketplace.

This study also supports the findings of Rahayu (2021) and Fauzan & Arsyad (2022), who stated that digital literacy and collaboration with external institutions are crucial factors in MSME human resource development in the Industrial Revolution 4.0 era.

However, there remains a gap between human resource capabilities and evolving technological needs. This demonstrates the need for a more structured, sustainable, and integrated human resource development strategy between MSMEs, local governments, and educational institutions.

3.2.1. Research Implications

The results of this study provide several important implications: 1) For MSMEs: Increased investment of time and resources in digital and soft skills training is necessary to adapt to technological developments. 2) For Regional Governments: Provide ongoing training programs, not just one-off training sessions, but with a mentoring system and outcome evaluation. 3) For Academics: Further research can focus on efficient community-based digital training models for regional MSMEs.

4. Conclusion

Conclusion Based on the results of the study on "Human Resource Development Strategies in Facing the Industrial Revolution 4.0 in MSMEs in Jambi City", several important things can be concluded as follows: 1) MSMEs in Jambi City have begun to realize the importance of human resource (HR) development as the main key in facing the digital era. The strategies implemented generally include internal training, collaboration with government agencies, increasing digital literacy, and soft skills development for employees. 2) Although HR development efforts have been carried out, the main challenges faced by MSMEs are still quite complex, including limited technological knowledge, limited funds and time for training, lack of continuous mentoring, and resistance to change. These conditions hamper the acceleration of digital transformation in the MSME sector. 3) HR development strategies have been proven to have a positive impact on improving the performance and competitiveness of MSMEs. Training and improving digital competencies help MSMEs expand their markets, increase operational efficiency, and improve the quality of customer service. 4) Synergy between MSMEs, local governments, and educational institutions is a determining factor in the success of HR development in the Industrial Revolution 4.0 era. Planned and sustainable collaboration can create a learning ecosystem that adapts to technological change. Therefore, it can be concluded that technology-based human resource development is a crucial foundation for MSMEs in Jambi City to remain viable and competitive in the era of the Industrial Revolution 4.0.

References

- Akbar, M. (2021). Kewirausahaan Ditengah Revolusi Industri 4.0 : Teori Dan Konsep Tinjauan Ekonomi Islam. *Adz-Dzahab: Jurnal Ekonomi dan Bisnis Islam*, 6(1), 13–24.
- Djaini, A., Permana, R. M., & Mahmudin, T. (2025). Analisis Strategi Adaptif UMKM terhadap Integrasi Teknologi ChatGPT sebagai Instrumen Peningkatan Daya Saing Berkelanjutan dan Akselerasi Inovasi Bisnis di Era Transformasi Digital. *Jurnal Minfo Polgan*, 14(01).
- Hendra, B., Pratama, S., Maghfiroh, S., Sifa, A., Rohmah, K. N., No, J. A. Y., Utara, K. P., & Tengah, J. (2024). Peran Pemerintah dan Strategi Penguatan Ekonomi Kerakyatan dalam Pemberdayaan UMKM Go Digital di Purwokerto. *Jurnal*

Ekonomi, Bisnis dan Manajemen (EBISMEN), 3(4), 382–401.

- Ilfi, A., Andini, X., Azzahra, T. (2023). Keterbatasan Sumber Daya Manusia dalam Proses Produksi di PT PAL Indonesia: Tantangan dan Strategi Peningkatan Kinerja Organisasi. *Jurnal Ilmiah Ekonomi dan Manajemen (JIEM)*, 1(4).
- Indah., C., L. Alfarizi., R. Sentot Imam Wahjono. (2025). Strategi Pengembangan Sumber Daya Manusia dalam Meningkatkan Ekonomi Lokal di UMKM surababaya. *Jurnal Ekonomi, Manajemen, Bisnis dan Sosial*, 5(2), 130–136.
- Pahira, S., H., Rio Rinaldy. (2023). Pentingnya Manajemen Sumber Daya Manusia (MSDM) Dalam Meningkatkan Kinerja Organisasi. *COMSERVA: Jurnal Penelitian dan Pengabdian Masyarakat*, 03(02), 810–817. <https://doi.org/10.59141/comserva.v3i03.882>
- Roudhotun, U., Janah, N., Roi, F., Tampubolon, S. (2024). Peran Usaha Mikro , Kecil , dan Menengah dalam Pertumbuhan Ekonomi: Analisis Kontribusi Sektor UMKM terhadap Pendapatan Nasional di Indonesia. *Jurnal Ekonomi dan Manajemen*, 1(2), 739–746.
- Susilowati, T., Mustafa, F., Hendratni, T. W., & Santosa, M. H. (2025). Pelatihan Dan Penguatan Literasi Digital Untuk Meningkatkan Kapasitas Umkm Menuju Pasar Internasional. *Jurnal Pengabdian Masyarakat dan Riset Pendidikan* , 4(1), 2554–2558.
- Utami, M. P., Salam, R., & Jakarta, U. M. (2024). Peran Divisi Human Capital dalam Meningkatkan Kinerja Karyawan Corporate Social. *Student Scientific Creativity Journal*, 2(5).
- Wulandari, R, Gion Ramadhan, Grafika Hijrah Kiska, Irwansyah, Popi Adella. (2024). UMKM Kebudayaan di Kabupaten Merangin, Provinsi Jambi: Peluang, Tantangan, dan Strategi Pengembangan. *ABDIMASYA / Jurnal Pengabdian Pada Masyarakat*, 2(2), 76–82.