

Digital-Based Work Environment to Improve the Performance of MSMEs Employees in the City of Malang

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Keywords

Digitalization; Work Environment; Employees; MSMEs

Abstract

Rapid changes in technology have led businesses to embrace digitalization, one example of which is the use of digitalization in the workplace. A digital-based work environment is a trend used by MSMEs today. The purpose of this study is to analyze the extent to which a digital-based work environment can provide employee performance improvements in MSMEs in Malang City. The method used is descriptive analysis and SLR. The results show that a digital-based work environment is more effective in MSMEs in Malang City, especially food and beverage MSMEs. With a completely digital environment ranging from attendance, performance measurement to salaries, it can encourage better employee performance. Key words: Work environment, employees, MSMEs, digitalization.

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1. Introduction

Advancements in information and communication technology have brought about significant changes in how organizations conduct business activities and manage human resources. Digital transformation is no longer merely a tool for operational support; it has become an integral part of organizational strategy to enhance efficiency, productivity, and competitiveness. These changes have also impacted organizational workflows, shifting from processes previously dominated by manual tasks to systems integrated through digital technology. This situation compels organizations—including Micro, Small, and Medium Enterprises (MSMEs)—to adapt to digital-based work environments in order to navigate an increasingly dynamic business landscape [1], [2].

MSMEs play a strategic role in supporting Indonesia's economic growth. Beyond contributing to the Gross Domestic Product (GDP), they also create jobs and improve public welfare. The city of Malang has experienced rapid MSME development, particularly in the food and beverage sector. Increasing business competition compels MSME operators to enhance the quality of their business management, including human resource management. One effective measure is the implementation of a digital-based work environment that supports work process effectiveness and boosts employee performance.

In academic literature, a digital-based work environment is understood as a work ecosystem that integrates technology, people, business processes, organizational structures, and cross-location work mechanisms to support the effective completion of tasks [1], [3]. A digital work environment is not limited to the use of specific applications or software; rather, it encompasses the entire work system that leverages digital technology to facilitate communication, collaboration, data management, and organizational decision-making

[2]. In line with this, Dabic et al. [4] explain that a digital work environment represents a virtualization of the conventional work environment, enabling work to be performed anytime and from anywhere through the support of digital technology. Karhapää et al. [5] add that this concept has evolved into a "phygital environment"—an integration of physical, digital, and social environments aimed at creating a more adaptive work experience.

Implementing a digital-based work environment offers various benefits to organizations. Literature indicates that the key characteristics of a digital work environment include connectivity, mobility, flexibility, and collaboration, as well as an organization's ability to manage information rapidly and accurately [6], [3]. A digital work environment also enables the formation of more flexible organizational structures, supported by technology that connects employees across locations, thereby making coordination processes more effective [7]. However, the effectiveness of a digital work environment depends not only on the technology employed but also on employees' digital competencies, ensuring alignment between individual capabilities and the implemented technology [8], [9].

In the context of MSMEs, the implementation of a digital-based work environment is generally achieved through the use of Human Resource Information Systems (HRIS), digital attendance and payroll systems, performance evaluation applications, and various internet-based communication platforms that facilitate more effective human resource management [10], [11], [12]. Such digitalization helps MSMEs reduce manual administrative processes, improve data accuracy, accelerate information dissemination, and support data-driven decision-making. Furthermore, the digitalization of human resources serves as a strategy to enhance workforce management efficiency, thereby supporting business sustainability [13].

Various studies indicate a positive relationship between digital work environments and improved employee performance. Based on a meta-analysis of 106 studies, Xu et al. [14] found that digital technology enhances task performance, innovation performance, employee engagement, job satisfaction, and job efficacy. The research also demonstrates that digital work environments contribute to increased organizational productivity and innovation. Similar results were reported by Oduro et al. [15], who stated that the implementation of digital technology positively impacts organizational performance, particularly regarding innovation and operational efficiency.

However, the impact of the digital work environment on employee performance is not automatic. Successful technology implementation is heavily influenced by various factors, such as digital competence, organizational readiness, work culture, leadership, and the alignment between technology and job requirements. Pacheco and Coello-Montecel [16] explain that digital competence enhances employee performance through psychological empowerment, while Öngel et al. [17] find that digital leadership plays a role in boosting creativity, which subsequently leads to improved performance. Zhang et al. [18] also state that task-technology fit is a crucial factor strengthening the relationship between the digital work environment and employee performance.

On the other hand, various studies indicate that implementing a digital work environment entails challenges that require attention. Xu et al. [14] explain that digital technology acts as a double-edged sword; while it can boost productivity, it also raises the risk of burnout, work-related anxiety, and diminished well-being if not balanced with adequate organizational support. For MSMEs, challenges in implementing digitalization generally stem from low digital literacy, infrastructure limitations, financial constraints, and resistance to organizational change [19], [20], [21]. These conditions mean that the digital transformation process has not yet reached optimal levels across all MSMEs. Despite these challenges, research findings show that digitalization yields significant benefits when supported by organizational readiness. Kaltum et al. [22] found that the adoption of cloud-based technology is positively associated with employee productivity and business sustainability in MSMEs. Subrata and Firman [23] also state that digital transformation can enhance operational efficiency, integrate business processes, and strengthen an organization's data analysis capabilities. Furthermore, the use of digital systems in financial administration and human resources improves the quality of information used in decision-making processes [24], [25].

Based on the foregoing, it is evident that a digital-based work environment holds significant potential to enhance employee performance by boosting productivity, flexibility, efficiency, and work innovation. However, the effectiveness of its implementation is heavily influenced by technological readiness, human resource competencies, organizational culture, and management support. To date, studies specifically addressing the implementation of digital-based work environments in MSMEs in Malang City remain relatively limited, particularly those that integrate findings from previous research using a Systematic Literature Review (SLR) approach.

Therefore, this study aims to analyze the concepts, characteristics, and dimensions of digital-based work environments; examine their impact on employee performance; and identify the implementation, benefits, challenges, and success factors associated with such environments in MSMEs in Malang City, based on a synthesis of prior research. The findings are expected to contribute theoretically to the development of research on digital-based work environments and serve as a practical reference for MSME operators in designing digitalization strategies that enhance employee performance and strengthen business competitiveness.

2. Research Methods

This study employs a Systematic Literature Review (SLR) method with a descriptive analysis approach to identify, evaluate, and synthesize prior research findings regarding digital-based work environments and their impact on employee performance in Micro, Small, and Medium Enterprises (MSMEs). The SLR method was selected for its ability to produce a systematic, objective, and comprehensive synthesis of the literature, thereby providing an overview of research developments, research gaps, and empirical findings related to the topic under study. The research process adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines, encompassing the stages of identification, screening, eligibility assessment, and the final selection of articles for analysis. The literature search was conducted across several reputable scientific databases with extensive publication coverage: Google Scholar, Scopus, ScienceDirect, SpringerLink, and Taylor & Francis Online. Searches utilized a combination of keywords in both Indonesian and English, including digital work environment, digital workplace, employee performance, digitalization, digital transformation, human resource digitalization, SMEs, UMKM, lingkungan kerja digital, and kinerja karyawan. This combination of keywords aimed to retrieve articles relevant to the study's focus: the relationship between digital-based work environments and enhanced employee performance in MSMEs.

Literature selection was conducted based on established inclusion and exclusion criteria. Inclusion criteria encompassed peer-reviewed scientific articles published in national or international journals, available in full-text format, published between 2020 and 2025, and addressing topics such as digital-based work environments, human resource digitalization, digital transformation, and employee performance within organizations or MSMEs. Exclusion criteria covered duplicate articles, those unavailable in full-text format, non-peer-reviewed conference proceedings, editorials, and articles lacking a direct connection to the research objectives. Following the selection process, articles meeting the criteria underwent in-depth analysis through data extraction. Information collected from each article included the author's name, publication year, country or research location, research methodology, research subject, variables examined, and key findings. The collected data were then grouped by thematic similarity to facilitate the synthesis of research results. Data analysis was performed using a qualitative descriptive approach. This technique was employed to interpret prior research findings by identifying patterns, relationships between variables, and similarities or differences across various studies. The literature synthesis focused on four key aspects: (1) the concepts, characteristics, and dimensions of digital-based work environments; (2) the impact of digital-based work environments on employee performance; (3) the implementation of digitalization in human resource management within MSMEs; and (4) the benefits, challenges, and success factors associated with adopting digital-based work environments. This categorization ensured that the discussion could be structured systematically in alignment with the research objectives.

To ensure the quality of the review, each article was evaluated based on topic relevance, methodological quality, and its contribution to the research discussion. The synthesis of findings involved comparing results across various business sectors—encompassing both large enterprises and MSMEs—to gain a comprehensive understanding of digital-based work environment implementation and its impact on enhancing employee performance. The analysis results are presented as a descriptive narrative that integrates findings from prior research, thereby providing a holistic overview of the implementation of digital-based work environments, particularly within MSMEs in Malang City.

To guide the literature synthesis process, this study is structured around four research questions (RQs): RQ1, how the concepts, characteristics, and dimensions of digital-based work environments are described in the literature; RQ2, how digital-based work environments influence employee performance; RQ3, how digital-based work environments are implemented within human resource management in MSMEs; and RQ4, what the benefits, challenges, and success factors are regarding the implementation of digital-based work environments to enhance employee performance in MSMEs. These four research questions serve as the foundation for the analysis and discussion, enabling the study to provide a systematic overview of the role of digital-based work environments in supporting improved employee performance within MSMEs in Malang City.

Table 1. Characteristics of the Reviewed Articles

No	Penulis	Tahun	Negara	Metode	Objek Penelitian	Fokus Penelitian	Temuan Utama
1	Mićić et al. [1]	2022	Serbia	Literature Review	Organisasi	Digital Workplace	Menjelaskan konsep lingkungan kerja digital sebagai ekosistem kerja.
2	Wibowo et al. [2]	2022	Indonesia	Systematic Review	Berbagai organisasi	Digital Work	Menjelaskan karakteristik dan dimensi lingkungan kerja digital.
3	White [3]	2012	Inggris	Conceptual Study	Organisasi	Digital Workplace	Menjelaskan karakteristik workplace modern.
4	Dery et al. [26]	2017	Australia	Empiris	Perusahaan	Digital Workplace	Employee connectedness dan responsive leadership meningkatkan efektivitas kerja.
5	Köffer [6]	2015	Jerman	Literature Review	Organisasi	Digital Workplace	Menjelaskan karakteristik kolaborasi, mobilitas, dan fleksibilitas kerja.
6	Xu et al. [14]	2025	China	Meta-analysis	Berbagai sektor	Digital Technology	Digital workplace meningkatkan task performance dan innovation performance.
7	Ng et al. [27]	2022	Singapura	Empiris	Perusahaan	Hybrid Work	Hybrid work meningkatkan produktivitas apabila didukung infrastruktur digital.
8	Oduro et al. [15]	2023	Ghana	Meta-analysis	Berbagai industri	Digital Transformation	Transformasi digital meningkatkan performa organisasi.
9	Pacheco &	2022	Ecuador	SEM	Perusahaan	Digital	Kompetensi digital

No	Penulis	Tahun	Negara	Metode	Objek Penelitian	Fokus Penelitian	Temuan Utama
	Coello-Montecel [16]					Competence	meningkatkan kinerja melalui empowerment.
10	Zhang et al. [18]	2024	China	SEM	Perusahaan	Enterprise Social Media	Task-technology fit meningkatkan task performance.
11	Reyhan & Achyani [12]	2025	Indonesia	Kuantitatif	UMKM	HRIS	HRIS meningkatkan efektivitas pengelolaan SDM.
12	Fatinah [10]	2022	Indonesia	Studi Kasus	UMKM	HRIS	Digital HR mempercepat administrasi SDM.
13	Firman [20]	2024	Indonesia	Literature Review	UMKM	Digital Readiness	Literasi digital menjadi faktor utama keberhasilan digitalisasi.
14	Kaltum et al. [22]	2025	Indonesia	Kuantitatif	UMKM	Cloud Technology	Cloud technology meningkatkan produktivitas dan keberlanjutan usaha.
15	Nursiva et al. [28]	2024	Indonesia	Kuantitatif	UMKM	Digital Leadership	Kepemimpinan digital meningkatkan kinerja karyawan.
16	Aryanto et al. [24]	2023	Indonesia	Empiris	UMKM	Digital Accounting	Akuntansi digital meningkatkan kualitas informasi keuangan.
17	Sahrul & Nuringsih [25]	2023	Indonesia	Empiris	UMKM	Digital Business	Digitalisasi meningkatkan kualitas pengambilan keputusan.
18	Juwita & Handayani [19]	2022	Indonesia	Empiris	UMKM	Digital Literacy	Rendahnya literasi digital menjadi hambatan digitalisasi.
19	Subrata & Firman [23]	2025	Indonesia	Empiris	UMKM	Digital Transformation	Transformasi digital meningkatkan produktivitas UMKM.
20	Nurlina et al. [29]	2024	Indonesia	Pengabdian	UMKM	Pendampingan Digital	Pelatihan meningkatkan kemampuan implementasi teknologi.
21	Dabic et al. [4]	2023	Kroasia	Review	Organisasi	Virtual Workplace	Menjelaskan konsep kerja virtual berbasis digital.
22	Karhapää et al. [5]	2024	Finlandia	Review	Organisasi	Phygital Workplace	Mengintegrasikan lingkungan fisik dan digital.
23	Rosca [30]	2025	Romania	Literature Review	Organisasi	Digital Workplace	Menjelaskan peluang dan tantangan digital workplace.
24	Alrasheedi et al. [31]	2022	Arab Saudi	Systematic Review	Organisasi	Workforce Transformation	Menjelaskan dimensi transformasi tenaga kerja digital.
25	Oberländer et al. [9]	2020	Jerman	Empiris	Organisasi	Digital Skills	Kompetensi digital memengaruhi keberhasilan digital workplace.

No	Penulis	Tahun	Negara	Metode	Objek Penelitian	Fokus Penelitian	Temuan Utama
26	Kozanoglu & Abedin [8]	2020	Australia	Empiris	Organisasi	Digital Competency	Digital competency menjadi syarat transformasi digital.
27	Dantas et al. [32]	2022	Brasil	Empiris	Perusahaan	Enterprise Social Media	Penggunaan media sosial kerja harus disertai regulasi yang jelas.
28	Liu et al. [33]	2025	China	SEM	Perusahaan	Workplace Digitalization	Job crafting memediasi pengaruh digitalisasi terhadap kinerja.
29	Hu & Lan [34]	2024	China	Empiris	Perusahaan	Digital HRM	Digital HRM meningkatkan innovative performance.
30	Selimović et al.	2021	Bosnia	Empiris	Sektor Keuangan	Digital Work Environment	Lingkungan kerja digital meningkatkan performa dan well-being.

3. Result and Discussion

3.1 Results

3.1.1 Concepts, Characteristics, and Dimensions of the Digital-Based Work Environment

The digital-based work environment is a concept that has evolved alongside the increasing use of digital technology in organizational activities. Synthesized literature indicates that a digital work environment is not merely defined by the use of a specific application or software; rather, it is a work ecosystem that integrates technology, people, business processes, organizational structures, and management systems to effectively facilitate the completion of work [1], [2], [3]. Consequently, the digital work environment represents a form of organizational transformation that alters how individuals work, communicate, collaborate, and make decisions through the use of information technology. Some studies describe the digital work environment as a virtual interpretation of the conventional workplace, enabling work to be performed anytime and from anywhere via digital technology [4]. This concept has further evolved into the "phygital workplace"—an integration of physical, digital, and social environments—resulting in a work experience that is more flexible and adaptable to change [5]. Rosca [30] explains that the digital work environment is a multidimensional, evolving concept that offers opportunities for increased productivity while simultaneously presenting challenges such as heightened digital surveillance, skills gaps, and workforce protection issues.

Study findings indicate that the key characteristics of a digital-based work environment include connectivity, collaboration, mobility, flexibility, and an organization's ability to manage information rapidly. Köffer [6] identified the primary characteristics of a digital workplace as collaboration, regulatory compliance, work mobility, and information load management. White [3] added that an effective digital work environment must possess comprehensive connectivity, adaptability to change, predictive capabilities, and innovativeness, while remaining independent of specific work locations. Nadkarni and Prügl [7] further explained that digitalization fosters more flexible organizational structures through cross-location work and network-based collaboration.

In the MSME sector, the characteristics of a digital work environment are manifested through the use of digital attendance systems, Human Resource Information Systems (HRIS), digital payroll, internet-based communication platforms, and integrated performance evaluation applications [10], [11], [12]. The implementation of these technologies helps reduce manual administrative processes, improve data accuracy, and accelerate decision-making. Literature also indicates that the digital work environment is multidimensional in nature. Wibowo et al. [2] categorize the dimensions of the digital work environment into three levels: individual, organizational, and societal. Dabic et al. [4] identify six key dimensions: digital competence, digital culture, digital workspace, employee empowerment, organizational collaboration, and

transformational leadership. Meanwhile, Dery et al. [26] explain that the success of a digital work environment is influenced by two primary dimensions: employee connectedness and responsive leadership. In the context of MSMEs, the most dominant dimensions include technology, human resource competence, and organizational readiness to manage digital transformation [20], [35].

Overall, the synthesis results indicate that a digital-based work environment is a system integrating technology, people, organizational culture, and corporate governance, thereby creating a work environment that is more flexible, collaborative, and data-oriented.

3.1.2 The Impact of a Digital-Based Work Environment on Employee Performance

The synthesis of results indicates that the majority of studies conclude there is a positive relationship between a digital-based work environment and employee performance. A meta-analysis conducted by Xu et al. [14] covering 106 studies demonstrates that the use of digital technology enhances task performance, innovation performance, employee engagement, job satisfaction, and job efficacy. These findings show that a digital work environment can boost individual productivity while simultaneously fostering organizational innovation. Similar findings were reported by Oduro et al. [15], who discovered that digital transformation positively impacts organizational performance, particularly regarding improvements in operational efficiency and business innovation. In a digitized work environment, communication processes become faster, access to information is facilitated, and coordination among employees becomes more effective, allowing work to be completed more efficiently.

However, research findings indicate that this positive influence does not occur directly. Digital competence, employee empowerment, creativity, and task-technology fit serve as mediating factors that strengthen the relationship between the digital work environment and employee performance [16], [17], [18]. This implies that the mere presence of digital technology does not necessarily enhance performance unless supported by employees' ability to utilize that technology effectively. Beyond the benefits, some studies have also identified negative impacts associated with digital work environments. Xu et al. [14] explain that the excessive use of digital technology can lead to increased burnout, work-related anxiety, and withdrawal behavior. Therefore, the implementation of a digital work environment must be accompanied by organizational policies that maintain a balance between job demands and employee well-being.

3.1.3 Implementation of a Digital-Based Work Environment in MSMEs

The study results indicate that the implementation of a digital-based work environment in MSMEs is carried out through the digitalization of administrative processes, communication, and human resource management. This digitalization is generally realized through the use of HRIS, digital attendance systems, electronic payroll, performance evaluation applications, and cloud-based data storage.

For MSMEs in Malang City—particularly in the food and beverage sector—the adoption of digital systems helps accelerate personnel administration processes, improve attendance data accuracy, simplify payroll calculations, and facilitate objective employee performance evaluations. Digital systems also enable business owners to monitor employee activities in real time, leading to faster and more accurate decision-making. Furthermore, digitalization fosters more effective communication between business owners and employees through the use of instant messaging apps, collaboration platforms, and internet-based communication tools. This implementation helps enhance work coordination, expedite information flow, and reduce communication errors in daily operations.

3.1.4 Benefits, Challenges, and Success Factors for Implementing a Digital-Based Work Environment

Based on a synthesis of the literature, the primary benefits of a digital-based work environment include increased productivity, operational efficiency, decision-making quality, innovation, and business sustainability [36], [22], [23]. Digital technology enables MSMEs to reduce administrative costs, accelerate business processes, and enhance customer service quality. However, the implementation of a digital work environment still faces various challenges. Low digital literacy, infrastructure limitations, a lack of training, capital constraints, and resistance to change serve as major obstacles to digital transformation for MSMEs

[19], [20], [21]. These challenges have resulted in many MSMEs being unable to utilize digital technology optimally.

The study results also indicate that the successful implementation of a digital work environment is heavily influenced by organizational readiness. Employee digital competence, management support, an adaptive organizational culture, digital leadership, and the availability of technological infrastructure are key factors determining the success of digitalization [36], [22], [28]. Thus, investment in human resource development plays a role just as important as investment in technology.

Overall, the research findings indicate that a digital-based work environment is an effective strategy for enhancing the performance of MSME employees in Malang City. Implementing digital systems for attendance tracking, performance evaluation, employee data management, and payroll processing can boost work effectiveness, accelerate administrative workflows, and facilitate more accurate decision-making. However, these benefits can only be fully realized if the organization is supported by adequate digital competencies, adaptive leadership, an organizational culture open to change, and sufficient technological infrastructure.

4. Conclusions

Based on the conducted Systematic Literature Review (SLR), it can be concluded that a digital-based work environment is a system integrating digital technology, human resources, business processes, and organizational governance to support work execution in a more effective, efficient, and flexible manner. A digital work environment focuses not only on the use of digital devices or applications but also encompasses aspects such as connectivity, collaboration, organizational culture, digital competence, and leadership capable of supporting organizational digital transformation. The synthesis of the literature indicates that digital-based work environments generally have a positive impact on enhancing employee performance.

However, the successful implementation of a digital work environment is not determined solely by the availability of technology. Factors such as employee digital competence, organizational readiness, management support, digital leadership, an adaptive work culture, and the availability of technological infrastructure determine the effectiveness of implementing a digital work environment. Conversely, low digital literacy, limited resources, resistance to change, and a lack of training remain challenges faced by many MSMEs during the digital transformation process.

Overall, the findings indicate that a digital-based work environment can serve as an effective strategy for enhancing employee performance in MSMEs in Malang City, provided that implementation is well-planned and supported by the readiness of both human resources and the organization. Therefore, MSME stakeholders need to develop digitalization strategies that focus not only on technology provision but also on enhancing employees' digital competencies, strengthening an adaptive organizational culture, and fostering leadership capable of supporting the digital transformation process on a sustainable basis.

5. References

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