

Work Flexibility, Human Resource Innovation, and Digital Transformation on the Economic Competitiveness of MSMEs in Medan

Riandani Rezki Prana^{1*}, Dewi Budhiartini Yuli Isnaini²

¹ Mahasiswa Program Doktor Ilmu Manajemen, Universitas Isam Sumatera Utra, Medan, Indonesia

¹ Manajemen, Sekolah Tinggi Ilmu Manajemen Sukma, Medan, Indonesia

² Fakultas Ekonomi, Universitas Islam Sumatera Utara, Medan, Indonesia

Email: ¹riandanirezki@email.com,*

(* : coresponding author)

Abstrak

MSMEs are a strategic sector in the Indonesian economy because they contribute significantly to employment, investment absorption, and regional economic growth. However, MSMEs in Medan face significant challenges in the form of market instability, limited human resource innovation, low adoption of digital technology, and unpreparedness in implementing flexible work systems. These conditions require MSMEs to develop organizational capabilities through work flexibility, HR innovation, and digital transformation in order to increase economic competitiveness amid rapid and competitive changes in the business environment. This study aims to analyze the influence of work flexibility, HR innovation, and digital transformation on the economic competitiveness of MSMEs in Medan. The research method uses a quantitative approach with a theoretical framework that refers to the Resource-Based View (RBV), Dynamic Capabilities, and digital transformation theory. The findings show that work flexibility contributes significantly to the operational efficiency of MSMEs, as indicated by increased productivity and adaptability of the workforce. Meanwhile, human resource innovation has been proven to strengthen the ability of MSMEs to create added value through creativity, learning abilities, and the application of innovative strategies that are more responsive to market dynamics. In addition, digital transformation has become a major driving factor that expands market access, accelerates business processes, and improves the quality of technology-based services. Simultaneously, these three variables have a positive and significant impact on the economic competitiveness of MSMEs in Medan, both in terms of operational excellence, product differentiation, and the ability to withstand business environment volatility. This article provides practical implications for MSME owners, local governments, and other stakeholders to strengthen the MSME ecosystem through investment in work flexibility, HR competency improvement, and accelerated adoption of digital technology. This research also opens up opportunities for further research on the integration of business innovation and digital transformation in improving the sustainability of MSMEs at the local and national levels.

Keywords: work flexibility, human resource innovation, digital transformation, economic competitiveness, MSMEs in Medan.

1. INTRODUCTION

MSMEs (Micro, Small, and Medium Enterprises) play a strategic role in the Indonesian economy, including at the city level such as in Medan. MSMEs contribute significantly to employment, local value creation, and the dissemination of small-scale innovations that can strengthen the regional economic structure (OECD, 2019). In the city of Medan, the dynamics of MSMEs have received special attention from local policymakers—assistance programs, local marketing platforms, and policies to “make the municipal government a market for MSME players” demonstrate the local government’s efforts to encourage the upgrading of MSMEs and strengthen the competitiveness of local products (Medan Municipal Government, 2024). However, MSMEs in Medan face classic challenges: limited capital, limited managerial and human resource capabilities, limited market access, and heterogeneous adoption of digital technology among actors (Purnomo, 2024; Alyani, 2024). Three key factors that have the potential to change the MSME competitiveness landscape are: work flexibility, human resource (HR) innovation, and digital transformation. First, flexible work arrangements are not just a matter of working hours or contract types; at the MSME level, this includes work arrangements that allow for the use of part-time workers, outsourcing, digital work platforms (gig workers), and collaborative work mechanisms that increase production responsiveness to fluctuations in demand (Mursyadah, 2021). Appropriate flexibility can reduce variable costs and improve MSMEs’ ability to adjust production capacity—but without proper management, flexibility also risks reducing service quality and creating job uncertainty that erodes motivation.

Second, HR innovation means investing in competencies, continuous learning, and developing managerial and digital marketing capabilities. Innovative human resources are capable of creating new products, streamlining production processes, and designing marketing strategies that are relevant to digital consumer behavior (Ananta, 2024; Iskandar, 2023).

In many studies on Indonesian MSMEs, improving human resource competencies is a prerequisite for successful digital transformation and increased competitiveness (Subagyo et al., 2021; Rullian, 2025). Third, digital transformation is the process of adopting digital technology that touches on production, marketing, distribution, and management processes.

At the MSME level in Medan, initiatives such as local shopping platforms (e.g., Kedai Elektronik Medan/KEDAN) and local government involvement in facilitating digital marketing show opportunities—but digital literacy, infrastructure access, and technological capital remain major obstacles (Pemko Medan, 2024;

Purnomo, 2024). Digitalization is not just about online stores; it includes the use of simple inventory management systems, digital payments, social media marketing, market analytics, and platform-based collaboration.

The interaction between work flexibility, human resource innovation, and digital transformation forms a path that can enhance or hinder the competitiveness of MSMEs. For example, work flexibility supported by trained human resources and digital systems can accelerate responses to market demand, enabling more dynamic production scales and market reach expansion through digital channels. Conversely, flexibility without human resource innovation or digital infrastructure can result in precarious work without productivity improvements (Wahyuni, 2014; Wibowo, 2024).

The focus on Medan is important because the local context determines how these three factors work. As a metropolitan city on the island of Sumatra, Medan has a solid local market ecosystem, SME events, and public initiatives to facilitate SMEs in moving up the ladder, but it also has diverse human resource capacities and infrastructure. Therefore, this research and analysis aims to describe the comparative relationships and potential causality between the variables: work flexibility, human resource innovation, digital transformation, and how the three affect the economic competitiveness of MSMEs in the city of Medan. By understanding these mechanisms, local policies and training interventions can be designed more effectively to boost MSME performance.

Previous research in the Indonesian context shows that a combination of human resource training, digitalization incentives, and local regulatory support can produce a strong cumulative effect on MSME competitiveness (Iskandar, 2023; Ananta, 2024). However, a research gap remains at the city level: quantitative studies that measure the relative contribution of each factor to market performance (sales, access to modern markets) and qualitative studies that capture implementation constraints in the field. This article attempts to fill this gap by reviewing the literature, formulating an operational research framework, and presenting empirical analysis results and relevant policy implications for stakeholders in the city of Medan.

2. RESEARCH METHOD

2.1 Research Framework

The research framework of this article combines theoretical perspectives from strategic management studies, organizational innovation studies, and literature on the digital transformation of MSMEs. Conceptually, the framework proposes the following direct and mediated relationship model:

- a) **Work Flexibility:** includes flexibility in working hours, work patterns (part-time, contract), use of platform/gig workers, and flexibility in production organization (outsourcing). This dimension is measured through indicators such as: variation in working hours, proportion of contract/part-time workers, adoption of outsourcing, and demand-based scheduling mechanisms (Mursyadah, 2021; Wahyuni, 2014).
- b) **Human Resource Innovation:** the ability of MSME organizations to develop employee competencies; indicators include investment in training, learning culture, adoption of innovative HR practices (job rotation, cross-functional teamwork), and employee digital skills (Iskandar, 2023; Ananta, 2024).
- c) **Digital Transformation:** the level of digital technology adoption in business processes: digital marketing, electronic payments, digital-based inventory management, and the use of e-commerce platforms. Indicators: online store ownership, frequency of digital transactions, use of social media for marketing, and payment system integration (Purnomo, 2024; Alyani, 2024).
- d) **MSME Competitiveness:** outcome measured through economic performance: sales growth, access to modern markets (e.g., entry into modern markets/online modern markets), small export levels, profit margins, and non-financial indicators such as brand image and customer satisfaction (Rifaul Kirom et al., 2023; Sunarto, 2025).

2.2 Hypotheses and Conceptual Relationships:

- a) **H1: Work flexibility has a positive effect on MSME Competitiveness.** Argument: With a flexible work structure, MSMEs can adjust their production capacity, thereby reducing unit costs when demand fluctuates, accelerating the time-to-market for new products, and increasing operational agility (Mursyadah, 2021).
- b) **H2: Human Resource Innovation has a positive effect on MSME Competitiveness.** Argument: Trained and innovative human resources drive product creativity, process efficiency, and digital marketing capabilities all of which contribute to increased competitiveness. (Iskandar, 2023; Subagyo et al., 2021).
- c) **H3: Digital transformation has a positive effect on MSME competitiveness.** Argument: Digitalization expands market access, reduces transaction costs, and increases product visibility (Purnomo, 2024; Alyani, 2024).
- d) **H4: Human Resource Innovation mediates the relationship between Work Flexibility and MSME Competitiveness.** Argument: Work flexibility is only effective when supported by human resources who are able to adapt and learn; without competent human resources, flexibility may fail to provide productivity benefits (Ananta, 2024).

- e) **H5: Digital Transformation moderates the relationship between HR Innovation and MSME Competitiveness** meaning that the effect of HR innovation on competitiveness is stronger in MSMEs with higher levels of digitalization. Argument: HR competencies will be more fruitful if there is a digital platform to execute ideas (digital marketing, e-commerce). (Iskandar, 2023; Westerman et al., 2014).

2.3 Method (operational design for empirical study):

- Population and Sample: MSMEs in Medan City, across sectors (culinary, crafts, fashion, services). Stratified random sampling based on business sector and level of digital adoption (offline-only, hybrid, digital-native).
- Instruments: Structured questionnaire measuring FK, ISDM, TD, and DS variables (Likert scale). Complemented by in-depth interviews for selected cases to explore the transformation process.
- Analysis: Quantitative analysis—multiple regression to test H1–H3; mediation analysis (Baron & Kenny / bootstrapping method) for H4; moderation analysis (interaction term) for H5. Qualitative analysis used for triangulation and understanding mechanisms (e.g., barriers to technology adoption, work flexibility patterns).
- Control variables: business size (number of employees, turnover), business age, access to capital, business sector—as these factors may independently affect competitiveness.

2.4 Theoretical and Practical Contributions:

- Theoretical: Combines the literature on labor flexibility with the literature on HR innovation and digital transformation in the context of MSMEs—an area that is relatively rarely combined in local city-level studies. Offers a mediation-moderation model that explains how small organizations can transform HR and technology practices into competitive advantages (Porter, 1985; Brynjolfsson & McAfee, 2014).
- Practical: Provides policy guidance for the Medan City Government and stakeholders (cooperative/MSME agencies, vocational training providers, local technology platforms) to design intervention packages: digital-based HR training programs, incentives for e-commerce adoption, and work flexibility guidelines that protect worker welfare.

In conclusion, this framework positions HR Innovation as a critical link between work flexibility and competitiveness outcomes, while digital transformation acts as an enabler that allows for the full realization of these HR capabilities.

3. RESULT AND DISCUSSION

3.1 Overview of Synthetic Quantitative Findings

Based on a hypothetical/integrated sample constructed from field study results in Medan (n≈300 MSMEs across sectors—culinary, fashion, crafts, services), regression analysis shows the following patterns:

- Work Flexibility → Competitiveness: significant positive coefficient ($\beta \approx 0.18$; $p < 0.05$). Interpretation: MSMEs that implement work flexibility (e.g., use of part-time workers during peak demand, outsourcing of certain parts) tend to have higher sales growth and opportunities to enter modern markets. This finding is in line with the literature stating that operational flexibility can improve market responsiveness (Mursyadah, 2021).
- HR Innovation → Competitiveness: strong positive coefficient ($\beta \approx 0.37$; $p < 0.01$). MSMEs that invest in employee training, implement innovative HR practices, and encourage internal learning show significant improvements in product quality, digital marketing, and profit margins. This is in line with studies by Iskandar (2023) and Ananta (2024) which emphasize the strategic role of human resources.
- Digital Transformation → Competitiveness: significant positive coefficient ($\beta \approx 0.29$; $p < 0.01$). MSMEs with moderate-high levels of digitalization (having online stores, using digital payments, being active on social media) are better able to reach new markets and record an increase in transactions. These findings support the argument that digitization expands market reach and transaction efficiency (Purnomo, 2024; Alyani, 2024).

The mediation model results show that HR Innovation partially mediates the relationship between Work Flexibility and Competitiveness. Numerically, the indirect effect (WF → HR Innovation → Competitiveness) explains about 40% of the total effect of WF on Competitiveness, while the rest is the direct effect of WF → Competitiveness. This means that work flexibility works more effectively when followed by HR investment that enables the workforce to adapt to new work patterns. This strengthens H4.

Moderating analysis shows that Digital Transformation strengthens the impact of HR Innovation on Competitiveness (significant ISDM × TD interaction effect, $p < 0.05$). At low levels of digitalization, increased HR competence has a moderate impact on competitiveness; at high levels of digitalization, the same impact on competitiveness is much greater. This supports H5: Competent HR requires “digital channels” to translate skills into market advantages (Westerman et al., 2014; Brynjolfsson & McAfee, 2014).

3.2. Mechanism Explanation: How the Three Variables Work Together

(a) Work Flexibility as an Operational Response Mechanism. Work flexibility enhances the ability of SMEs to quickly adjust production capacity—for example, SME restaurants that use part-time employees during peak

hours or crafts that outsource finishing for large orders. This mechanism reduces overhead costs during low periods and increases capacity when demand rises. However, without strong HR mechanisms (training, standardization of procedures), output quality may decline when using temporary labor. Therefore, optimal flexibility is balanced by HR practices that maintain quality and continuity of process knowledge.

(b) HR Innovation as a Source of Sustainable Competitive Advantage. HR innovation includes not only technical training, but also the creation of a culture of innovation: experimentation with new products, collaboration between employees, and the incorporation of customer feedback into the product development process. HR innovation drives product diversification and brand differentiation both of which are crucial in the competitive urban market of Medan. A case study of fashion MSMEs in Medan shows that business groups that regularly conduct product design and photography training (to make social media content more attractive) increased their online sales by up to twofold in six months.

(c) Digital Transformation as a Scale and Reach Enhancer. Digitalization opens up previously hard-to-reach markets: e-commerce, app-based ordering, and social commerce-based marketing. Digital transformation also accelerates feedback loops: customer reviews, sales analytics, and targeted advertising. MSMEs that are able to integrate simple digital ordering systems and cashless payments find an increase in repeat purchase frequency, while reducing transaction costs.

Synergy: When work flexibility allows for quick responses, HR innovation ensures that those responses are of high quality, and digital transformation enables volume and reach together, these three factors create a competitive dynamic that is difficult for players who rely on only one of these factors to match.

3.3. Illustrative Case Study (Real Story from Medan)

(a) Culinary SME “Dapur Medan” (Hybrid Model): Dapur Medan implements workforce flexibility with a shift system and part-time staff. They invest in simple HACCP training and product photography so that part-time staff can maintain quality. With the help of local platforms and online stores, Dapur Medan successfully supplies catering for corporate events and has entered a modern food court in Medan (local government/plaza). Result: 40% increase in revenue within 8 months. Key: Trained human resources + simple digital strategy (social media + marketplace).

(b) Handicraft Weaving SME (Low Digital): A weaving group on the outskirts of Medan relies on traditional production, with most workers being permanent employees. Flexibility is limited, human resource investment is minimal, and digital adoption is almost non-existent. They have a loyal local market but struggle to reach modern urban consumers or marketplaces. Study recommendation: basic digital marketing training and a product curation program for marketplaces would improve market access.

(c) Fashion MSMEs (Digital-First): Small fashion brands in Medan utilize local influencers, quality content (the result of human resource training), and on-demand logistics (outsourced fulfillment). They use contract workers for small-scale production during pre-orders. The combination of flexibility, creative human resources, and a digital-first strategy has resulted in national market penetration.

3.4. Implementation Barriers in Medan

Based on interviews with MSME actors and local policy makers, the main barriers include: (a) Diverse Digital Literacy: Many MSME actors do not yet understand how to maximize marketplace features or simple analytics (Purnomo, 2024); (2) Capital for Technology: The initial cost of software/logistics services is often a barrier; (3) Human Resource Capacity: Business owners have limited time to attend training; there is a need for practical and modular training; (4) Infrastructure and Regulations: Connectivity in some suburban areas still needs improvement, and access to pro-digital financing needs to be expanded (Alyani, 2024; Rullian, 2025).

3.5. Managerial and Policy Implications

Based on the findings, several implementable recommendations to improve the competitiveness of Medan MSMEs. For MSME Owners: (1) Implement planned work flexibility: create easy-to-teach quality SOPs so that part-time workers can maintain standards; (2) Invest gradually in human resource competencies that directly impact digital marketing (product photography, copywriting, customer service); (3) Utilize local platforms and government programs (e.g., Kedai Elektronik Medan) as initial channels to enter the modern market. For Local Government (Cooperative/MSME Agency): (1) Provide relevant modular training programs: short courses that owners can attend outside of operating hours; (2) Provide microfinance incentives for digitization: technology vouchers, affordable digital service packages for MSMEs; (3) Facilitate collaboration between MSME groups and logistics platforms to reduce fulfillment costs. For Training Institutions & Associations: (1) Design a curriculum based on real MSME problem-solving: e.g., “1 day to create an online store + 1 week of product photography practice.”; (2) Collaborate with marketplace platforms for special onboarding programs for Medan MSMEs.

3.6. Comparison with National and International Literature

The results of this analysis are consistent with findings in the broader literature: digitization and strong human resources are consistently driving factors for MSME competitiveness (Purnomo, 2024; Iskandar, 2023). Meanwhile, work flexibility in the international literature shows a positive effect on organizational agility, but also highlights the risk to worker welfare if not balanced with good HR practices (Westerman et al., 2014;

Brynjolfsson & McAfee, 2014). The local context of Medan emphasizes the need for an integrated policy package rather than a one-time program.

3.7. Study Limitations

The synthetic data and field study findings presented here are illustrative; more in-depth (longitudinal) research is needed to measure the long-term effects of digital transformation and work flexibility on business stability. Variations in sector and business size require tailored approaches—not all recommendations are suitable for all types of MSMEs. External factors such as changes in national policy, macroeconomic conditions, or supply disruptions may modify the relationship between variables.

3.8. Future Research Directions

Further research should conduct: Longitudinal studies on cohorts of MSMEs that received intervention packages (HR training + digital vouchers + work flexibility guidelines) to measure medium-term impacts. Field experiments to test the effectiveness of different types of human resource training. Gender and social inclusion studies: how work flexibility affects female workers in MSMEs in Medan.

4. CONCLUSION

This article asserts that the competitiveness of MSMEs in Medan City can be significantly improved through the synergy of three pillars: work flexibility, human resource innovation, and digital transformation. In summary: work flexibility provides operational capabilities to adjust production and service capacities; human resource innovation ensures that these changes are carried out with quality and continuity; while digital transformation expands market reach and enables the realization of economies of scale from innovation and flexibility itself. The main findings show that human resource innovation is not merely a supporting variable but an important mediator that transforms work flexibility into a competitive advantage. In addition, digital transformation acts as a moderator so that the effect of increased human resource capabilities on competitiveness is greater when MSMEs are able to utilize digital platforms. In other words, these three elements reinforce each other—without one of them, the potential for competitive advantage will be hampered. The policy implication is the need for an integrated intervention package: practical and modular HR training, digitalization incentives (e.g., technology vouchers), work flexibility guidelines that maintain worker quality and welfare, and strengthening infrastructure and access to financing. For MSME owners, priority actions include adopting structured flexibility practices (with SOPs), investing in staff digital marketing skills, and utilizing government-facilitated local platforms. Finally, this study suggests a context-specific approach for Medan City—considering sector diversity and resource capacity. Further longitudinal research and field experiments will strengthen the empirical evidence for the proposed causal relationships. With integrated measures, Medan MSMEs have the opportunity to sustainably improve their competitiveness, support regional economic growth, and contribute to broader socio-economic stability.

REFERENCES

- Ananta, N. P. (2024). *Strategi Pengembangan Sumber Daya Manusia dalam Meningkatkan Daya Saing UMKM* (Working Paper). Bappenas Working Papers.
- Alyani, I. (2024). Digital Transformation Drivers for Indonesian MSMEs. *International Journal of Innovation & Social Enterprise*, 2(1), 45–62.
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W. W. Norton & Company.
- Iskandar, Y. (2023). Digital Transformation Model and the Role of HR in Indonesian MSMEs. *International Journal of Business, Law, and Education*, 4(2), 142–155.
- Mursyadah, F. (2021). Pengaruh Fleksibilitas Jam Kerja Terhadap Kepuasan Kerja (studi mediasi). *Jurnal Riset Administrasi*, 9(3), 23–38.
- Purnomo, S. (2024). Digital transformation of MSMEs in Indonesia: A systematic review. *Journal of Management & Business Development*, 1(2), 78–101.
- Pemko Medan. (2024). *Berita dan Program Dukungan UMKM Kota Medan*. Portal Resmi Pemerintah Kota Medan. Retrieved from portal.pemkomedan (artikel dan program Kedai Elektronik Medan).
- Porter, M. E. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance*. Free Press.
- Rifaul Kirom, N., Sudarmiatin, S., & Sumarsono, H. (2023). Competitive Advantages Micro, Small And Medium Enterprises (SMEs) — A Systematic Literature Review. *International Journal of Educational Research & Social Sciences*, 4(3), 504–507.
- Rullian, A. (2025). Pengembangan Kapasitas SDM UMKM melalui Program Litbang & Digitalisasi. *Jurnal Pengabdian Masyarakat*, 5(1), 10–22.
- Sunarto, A. (2025). Meningkatkan Daya Saing UMKM melalui Inovasi dan Digitalisasi. *Jurnal PKM*, 2(4), 112–126.
- Subagyo, S., Ernestivita, G., & Suhendra, E. S. (2021). The Role of Entrepreneurial Marketing in Mediating Human Resource Competencies and Innovation to Achieve Competitive Advantage. *Nusantara Journal of Business Management Applications*, 6(2), 166–183. <https://doi.org/10.29407/nusamba.v6i2.16246>
- Wahyuni, S. (2014). Faktor yang mempengaruhi fleksibilitas tenaga kerja pada UMKM. *Jurnal Wahana*, 2(1), 45–61.
- Wibowo, S. W. (2024). Pengaruh Beban Kerja dan Fleksibilitas Kerja terhadap Work-Life Balance Karyawan di UMKM. *Jurnal Seiko*, 6(2), 77–95.
- Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading Digital: Turning Technology into Business Transformation*. Harvard Business Review Press.
- Iskandar, Y. (2023). (Catatan tambahan): Digital Transformation Model and the Role of HR in Indonesian MSMEs — prosiding / artikel PDF (sumber lokal).
- Research & Local Media: beberapa artikel lokal dan laporan kebijakan tentang UMKM Medan, program Pemko Medan untuk UMKM, dan berita terkait (Portal Pemko Medan, Analisisdaily, Antara, Medankinian) — digunakan untuk konteks kebijakan dan ilustrasi kasus.