“Why readiness is not enough: Routinized digital use and MSME competitiveness”

AUTHORS	Meirani Harsasi Isbandriyati Mutmainah Aprihatiningrum Hidayati Erni Ernawati

ARTICLE INFO	Meirani Harsasi, Isbandriyati Mutmainah, Aprihatiningrum Hidayati and Erni Ernawati (2026). Why readiness is not enough: Routinized digital use and MSME competitiveness. *Problems and Perspectives in Management*, *24*(2), 487-501. doi:10.21511/ppm.24(2).2026.33
DOI	http://dx.doi.org/10.21511/ppm.24(2).2026.33
RELEASED ON	Tuesday, 09 June 2026
RECEIVED ON	Sunday, 15 February 2026
ACCEPTED ON	Friday, 08 May 2026

JOURNAL	"Problems and Perspectives in Management"
ISSN PRINT	1727-7051
ISSN ONLINE	1810-5467
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
49	1	7

BUSINESS PERSPECTIVES

LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine

www.businessperspectives.org

Meirani Harsasi (Indonesia), **Isbandriyati Mutmainah** (Indonesia), **Aprihatiningrum Hidayati** (Indonesia), **Erni Ernawati** (Indonesia)

WHY READINESS IS NOT ENOUGH: ROUTINIZED DIGITAL USE AND MSME COMPETITIVENESS

Abstract

Digital transformation has become a strategic priority for micro, small, and medium-sized enterprises (MSMEs), yet its business effects remain uneven because digital adoption does not always translate into sustained organizational gains. This study examines whether digital readiness conditions and technology acceptance beliefs help Indonesian MSMEs convert digitalization into organizational performance and competitiveness through routinized digital technology use. The study uses primary survey data collected in Indonesia between January and June 2025 from 404 MSME owners and managers, and analyzes these data using partial least squares structural equation modeling (PLS-SEM). The results show that organizational readiness positively influences routinized digital technology use ($\beta = 0.425$, $p < 0.001$), while perceived usefulness is the strongest direct predictor of routinized use ($\beta = 0.807$, $p < 0.001$). Perceived ease of use significantly increases perceived usefulness ($\beta = 0.688$, $p < 0.001$). By contrast, technological readiness ($\beta = 0.051$, $p = 0.095$) and environmental readiness ($\beta = -0.014$, $p = 0.649$) do not have significant direct effects on routinized use. Routinized digital technology use positively affects organizational performance ($\beta = 0.680$, $p < 0.001$) and competitiveness ($\beta = 0.672$, $p < 0.001$), while organizational performance also strengthens competitiveness ($\beta = 0.133$, $p = 0.023$). These findings indicate that MSME digital transformation creates greater business value when digital tools become embedded in recurring work routines rather than remaining at the level of access or initial adoption.

Keywords digitalization, readiness, usefulness, routinization, performance, competitiveness, MSMEs

JEL Classification M15, L26, O33, D23

Type of the article: Research Article

Received on: 15th of February, 2026
Accepted on: 8th of May, 2026
Published on: 9th of June, 2026

Meirani Harsasi, Dr., Associate Professor, Department of Management, Faculty of Economics and Business, Universitas Terbuka [Indonesia Open University], Indonesia. (Corresponding author)

Isbandriyati Mutmainah, Dr., Associate Professor, Department of Management, Faculty of Economics and Business, Universitas Nusa Bangsa [Nusa Bangsa University], Indonesia.

Aprihatiningrum Hidayati, Dr., Associate Professor, Department of Management, PPM School of Management, Indonesia.

Erni Ernawati, Dr., Associate Professor, Department of Management, PPM School of Management, Indonesia.

Conflict of interest statement:
Author(s) reported no conflict of interest

INTRODUCTION

Digital transformation has become a critical issue for micro, small, and medium-sized enterprises (MSMEs) as business activities increasingly depend on digital platforms, online transactions, data-driven communication, and technology-mediated customer interactions. Customers now search for products, compare alternatives, communicate with sellers, and complete transactions through digital channels, thereby changing how small firms compete and create value (OECD, 2021; World Bank, 2021; Verhoef et al., 2021). In this environment, digitalization is no longer only a matter of technological access, but is closely related to business resilience, operational efficiency, market reach, and competitiveness (Eller et al., 2020; Matarazzo et al., 2021). This issue is particularly relevant in Indonesia, where MSMEs play an important role in economic activity and where digital transformation has been promoted as part of broader efforts to strengthen productivity, inclusion, and business adaptation (Cabinet Secretariat of the Republic of Indonesia, 2022; Ministry of Administrative and Bureaucratic Reform of the Republic of Indonesia, 2024).

Despite this growing relevance, the economic consequences of MSME digitalization remain uneven. Many MSMEs have adopted digital payments, social media promotion, marketplace platforms, or other digital tools, yet such adoption does not always produce sustained improvements in organizational performance or competitive position (Kurniawati et al., 2021; Chatterjee et al., 2022). The central scientific problem is that digital presence does not necessarily become business value when digital tools remain fragmented, occasional, or weakly connected to daily routines. Organizational value is more likely to emerge when technology is used effectively and embedded in recurring business processes rather than treated as a formal adoption milestone (Devaraj & Kohli, 2003; Burton-Jones & Grange, 2013). This problem is especially important in MSME settings, where limited managerial capacity, uneven digital skills, constrained resources, and different perceptions of technology value may cause firms with similar digital access to experience different outcomes. Consequently, the unresolved issue is how digital readiness and technology acceptance are converted into routinized digital use that supports organizational performance and competitiveness, rather than remaining at the level of symbolic or initial adoption.

1. LITERATURE REVIEW AND HYPOTHESES

Digital transformation in MSMEs should not be reduced to a single adoption event, because its economic significance depends on how digital tools are used, integrated, and sustained in everyday business activity (Verhoef et al., 2021; Kraus et al., 2022; OECD, 2021; World Bank, 2021). In many MSME settings, digitalization begins with visible actions such as opening online sales channels, using digital payments, or registering on platforms, yet these steps do not automatically indicate meaningful organizational transformation (Kurniawati et al., 2021; Chatterjee et al., 2022; Aminullah et al., 2024; Sagala & Őri, 2024). This issue is particularly salient in Indonesia, where MSME digitalization has been promoted as part of a broader national agenda for productivity, inclusion, and resilience (Cabinet Secretariat of the Republic of Indonesia, 2022; Ministry of Administrative and Bureaucratic Reform of the Republic of Indonesia, 2024). At the same time, the literature shows that MSMEs differ substantially in how they absorb, enact, and benefit from digital initiatives, which suggests that digital transformation cannot be inferred from access or adoption alone (Ben Slimane et al., 2022; Eller et al., 2020; Kurniawati et al., 2021; Aminullah et al., 2024). Accordingly, the literature needs to be organized around the mechanism through which digital transformation becomes economically consequential for MSMEs.

That mechanism is best captured through the concept of digital technology use as enacted and routinized practice. Information systems value research has long argued that performance effects arise less from nominal adoption and more from actual use within business processes (Devaraj & Kohli, 2003). The effective use perspective strengthens this argument by showing that technology becomes value-producing when it is purposefully applied to accomplish task goals and gradually embedded in recurring routines, thereby distinguishing symbolic use from economically meaningful use (Burton-Jones & Grange, 2013). This view is increasingly echoed in the MSME digitalization literature, which shows that digital transformation contributes to business outcomes when firms align technologies with operational needs, customer interactions, and organizational routines rather than treating digital tools as isolated artefacts (Matarazzo et al., 2021; Canhoto et al., 2021; Hassan et al., 2024; Merín-Rodrigáñez et al., 2024; Hakim et al., 2026). In this sense, digital technology use is not simply an outcome of adoption, but the behavioral conduit through which digital transformation can plausibly generate performance and competitiveness advantages.

A coherent explanation of that conduit can be developed by combining readiness-oriented and belief-oriented perspectives. From the readiness side, the Technology–Organization–Environment (TOE) framework explains technology engagement through technological resources, organizational capabilities, and environmental conditions that shape feasibility, pressure, and support (Tornatzky et al., 1990; Oliveira & Martins, 2011). From the belief side, the Technology Acceptance Model (TAM) explains continued engagement through evaluative beliefs, especially perceived

http://dx.doi.org/10.21511/ppm.24(2).2026.33

usefulness and perceived ease of use (Davis, 1989; Venkatesh et al., 2003). This integration is particularly relevant for MSMEs because structural readiness may facilitate digital engagement, yet sustained use may still depend on whether the technology is seen as worthwhile and manageable within daily constraints (Chatterjee et al., 2021; Cho et al., 2022; Hashimy et al., 2022). Accordingly, digital transformation in MSMEs should be understood as a process shaped both by enabling conditions and by managerial or user beliefs that determine whether digital resources are translated into stable business practice.

Within the TOE perspective, technological readiness refers to the adequacy, compatibility, and reliability of digital resources required for stable implementation, which can reduce disruption and support the consistent enactment of technology in routine processes (Tornatzky et al., 1990; Oliveira & Martins, 2011; Ekasari et al., 2021; Setiyani & Rostiani, 2021). Organizational readiness captures internal capacity such as managerial commitment, skills, training access, strategic alignment, and resource allocation, which are especially important in MSMEs where decision authority is concentrated in owner-managers and internal slack is limited (Kurniawati et al., 2021; Widyastuti et al., 2023; Aminullah et al., 2024; Canhoto et al., 2021; Ben Slimane et al., 2022). Environmental readiness reflects customer expectations, competitive intensity, ecosystem support, and institutional conditions that may motivate digitalization but can produce uneven results when internal capability is weak or fragmented (N'Dri & Su, 2024; Nugraha et al., 2022; Chittipaka et al., 2022; Aminullah et al., 2024). Together, these dimensions indicate that digital technology use depends not only on whether digital resources exist, but also on whether firms are organizationally able and environmentally encouraged to deploy them effectively.

The TAM perspective adds an equally important motivational explanation. Perceived usefulness captures the belief that digital tools improve task performance, efficiency, customer reach, or broader business outcomes, whereas perceived ease of use captures the extent to which those tools are understandable and effort-saving in practice (Davis, 1989; Venkatesh et al., 2003). For MSMEs, these beliefs are highly consequential because digital decisions are usually pragmatic and resource-sensitive, making continued use unlikely when digital tools are seen as burdensome or lacking a clear payoff. Prior studies consistently show that usefulness tends to remain a strong predictor of sustained engagement, while ease of use often works indirectly by lowering barriers and strengthening usefulness perceptions (Chatterjee et al., 2021; Cho et al., 2022; Hashimy et al., 2022). Related work on SME digital transformation also suggests that leadership, learning, and incremental alignment shape whether technologies are perceived as both manageable and valuable in daily operations (Canhoto et al., 2021; Sagala & Őri, 2024). This implies that readiness conditions alone may be insufficient unless they are accompanied by beliefs that support routinized use.

Once digital technology use becomes sustained and embedded, it provides the operational channel through which digitalization can influence organizational outcomes. Technology use can improve information quality, coordination, decision-making, and responsiveness within business processes, thereby supporting organizational performance when it is enacted consistently rather than intermittently (Devaraj & Kohli, 2003; Burton-Jones & Grange, 2013). In MSME settings, empirical evidence links digital engagement with stronger financial, marketing, resilience, and sustainability outcomes, especially when usage is aligned with implementation discipline and internal capability (Purba et al., 2021; Gao et al., 2023; Wirdiyanti et al., 2023; Hassan et al., 2024; Merín-Rodrigáñez et al., 2024). Competitiveness can also be strengthened when routinized digital use becomes an embedded organizational resource that supports differentiation, responsiveness, and value creation in ways that are difficult to replicate (Barney, 1991; Roostika, 2019; Matarazzo et al., 2021). From a dynamic capabilities perspective, sustained digital use can further strengthen competitiveness by enabling firms to sense, seize, and reconfigure more effectively under changing conditions (Teece et al., 1997; Putritamara et al., 2023; Martín-Rojas et al., 2023). Studies in Indonesian and other emerging-market MSME contexts therefore suggest that competitiveness depends less on access alone and more on meaningful utilization and its translation into adaptive rou-

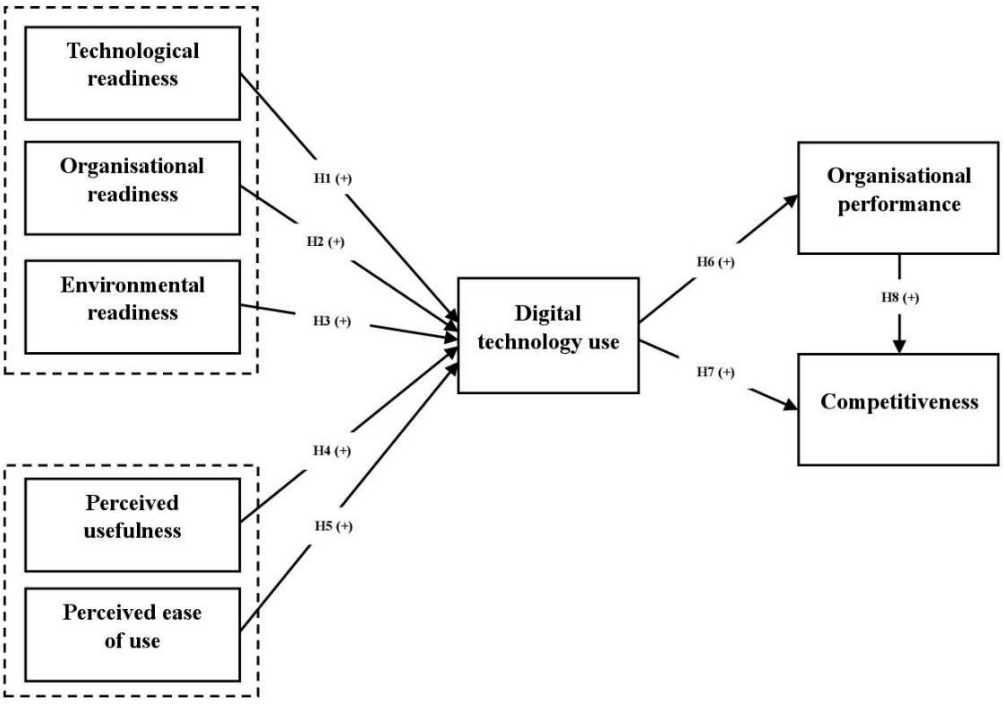

Figure 1. Conceptual framework

tines and business outcomes (Widyastuti et al., 2023; Putritamara et al., 2023; Martín-Rojas et al., 2023; Sigalingging & Sinaga, 2025).

The literature suggests that digital transformation becomes economically consequential for MSMEs when readiness conditions and acceptance beliefs are converted into sustained and routinized digital technology use. This mechanism-centered explanation is important because digital readiness, platform access, and favorable perceptions may not automatically generate business value unless they are embedded in recurring organizational practices. Accordingly, this study positions digital technology use as the behavioral mechanism linking technological, organizational, and environmental readiness, together with perceived usefulness and perceived ease of use, to organizational performance and competitiveness. The conceptual relationships examined in this study are illustrated in Figure 1.

The aim of this study is therefore to examine how readiness conditions and technology acceptance beliefs shape routinized digital technology use among Indonesian MSMEs, and how such use contributes to organizational performance and competitiveness, including the additional role of organizational performance in strengthening MSME competitiveness.

The hypotheses of the study are as follows:

H1: Technological readiness positively influences digital technology use.

H2: Organizational readiness positively influences digital technology use.

H3: Environmental readiness positively influences digital technology use.

H4: Perceived usefulness positively influences digital technology use.

H5: Perceived ease of use positively influences perceived usefulness.

H6: Digital technology use positively influences organizational performance.

H7: Digital technology use positively influences competitiveness.

H8: MSME performance positively influences competitiveness.

http://dx.doi.org/10.21511/ppm.24(2).2026.33

2. METHODOLOGY

This study adopted a quantitative, explanatory approach and employed a cross-sectional survey to test an integrated TOE–TAM model linking readiness conditions and technology acceptance beliefs to digital technology use and subsequent MSME outcomes. Partial least squares structural equation modeling (PLS-SEM) was selected because the model estimates a multivariate network of reflective latent constructs and is evaluated with an emphasis on explained variance and prediction-oriented assessment, which is appropriate for field-based MSME survey research (Hair & Alamer, 2022; Ringle et al., 2023). The empirical context comprised Indonesian MSMEs operating in consumer-facing activities, particularly food and beverage, fashion, and crafts, where heterogeneity in organizational capability and perceived technology value is theoretically important for explaining sustained utilization and its performance consequences (Hair & Alamer, 2022).

The target population consisted of Indonesian MSME owners and managers who had already used digital technology for business purposes. The unit of analysis was MSMEs, captured through an owner or manager acting as a knowledgeable key informant who could report on firm-level practices and outcomes, which is suitable when standardized firm records are not consistently available across micro and small businesses (Podsakoff et al., 2024). A purposive sampling strategy was applied to align participation with the study scope, and eligibility was enforced through screening criteria requiring respondents to operate an active MSME, to use digital technology for business activities, to have reliable internet access, and to use a digital device to support business operations. Data were collected between January and June 2025 through an online questionnaire administered using Google Forms and disseminated via MSME communities, entrepreneur networks, and digital business groups across several Indonesian regions, including major urban centers across Java, Sumatra, Sulawesi, and Bali, specifically targeting high-growth digital ecosystems in cities like Jakarta, Surabaya, Medan, and Makassar. The Indonesian setting was selected because MSME digitalization has become a major policy priority. At the same time, the extent to which digital tools are embedded in business routines remains heterogeneous across sectors and regions. The six-month collection period was chosen to broaden outreach beyond a single network, reduce temporal clustering of responses, and capture participation from MSMEs operating under different business conditions during the same general period. To support external validity under non-probability sampling, dissemination was intentionally diversified across communities and regions, and the resulting sectoral and demographic composition was checked for reasonableness against publicly available MSME profiles where feasible (Podsakoff et al., 2024). To mitigate duplicate and low-quality submissions, responses were restricted to one submission per respondent where feasible, and cases were excluded if they were incomplete, exhibited straight-lining or internally inconsistent patterns, or were completed in implausibly short times, consistent with online survey data-quality guidance (Kock et al., 2021; Podsakoff et al., 2024). After screening, 404 valid responses were retained, and the respondent and business profile are reported in Table 1. In addition to gender, age, business sector, and firm age, Table 1 also reports respondent role, business size, region, and years of digital technology use because these characteristics may plausibly affect how respondents evaluate and use digital technologies in MSME settings.

Ethical safeguards were implemented through voluntary participation, informed consent, impartial administration, and anonymous data collection. Before accessing the questionnaire, respondents were presented with a short consent statement explaining the academic purpose of the study, the voluntary nature of participation, the approximate completion time, and their right to discontinue the survey at any point without penalty. No personally identifying information was collected, and responses were analyzed and reported only in aggregate form. Impartiality was supported through standardized online administration, identical instructions for all respondents, and the absence of interviewer intervention during questionnaire completion. Because the study involved an anonymous online survey of adult business owners and managers and did not collect sensitive personal data, it was treated as minimal-risk survey research. No formal ethics committee approval was required under the authors' institutional procedures. Given the single-source design, procedural protections were also applied to reduce evaluation apprehension and method-related artefacts, and statistical diagnostics were incorporated to evalu-

ate whether common method effects were likely to threaten the substantive conclusions (Kock et al., 2021; Podsakoff et al., 2024). The dataset was collected specifically for this study and has not been used as the empirical basis for other publications.

Table 1. Respondents' profile

Characteristics	Frequency	Percentage
Gender		
Male	130	32.18%
Female	274	67.82%
TOTAL	404	100.00%
Age		
< 30 years	84	20.79%
30–39 years	118	29.21%
40–49 years	112	27.72%
50–59 years	69	17.08%
≥ 60 years	21	5.20%
TOTAL	404	100.00%
Business Sector		
Food and beverage	222	54.95%
Retail	19	4.70%
Services	19	4.70%
Craft	50	12.38%
Fashion	82	20.30%
Other	12	2.97%
TOTAL	404	100.00%
Firm age		
< 3 years	142	35.15%
3–6 years	135	33.42%
7–10 years	65	16.09%
> 10 years	62	15.35%
TOTAL	404	100.00%
Respondent role		
Owner	314	77.72%
Manager	90	22.28%
TOTAL	404	100.00%
Business size		
Micro	275	68.07%
Small	96	23.76%
Medium	33	8.17%
TOTAL	404	100.00%
Region		
Java	246	60.89%
Sumatra	56	13.86%
Sulawesi	77	19.06%
Bali	25	6.19%
TOTAL	404	100.00%
Years of digital technology use		
< 2 years	97	24.01%
2–4 years	149	36.88%
5-7 years	95	23.51%
> 7 years	63	15.59%
TOTAL	404	100.00%

All constructs were modeled reflectively and measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument comprised eight latent constructs representing the TOE–TAM integration, namely technological readiness, organizational readiness, environmental readiness, perceived ease of use, perceived usefulness, digital technology use, organizational performance, and competitiveness. Item wording was adapted to the MSME context while preserving conceptual alignment with each construct definition, and the full construct codes, operational definitions, and item statements are provided in Appendix A (Table A1) to support transparency and replicability. The questionnaire was administered in Bahasa Indonesia using a translation and back-translation procedure, and the instrument was pilot-tested with a small group of MSME respondents to refine wording clarity prior to full deployment (Cheung et al., 2024). Where contextual wording adjustments were required, items were refined to maintain semantic clarity and minimize construct-irrelevant variance, consistent with best-practice guidance for measurement quality in SEM-based research (Cheung et al., 2024; Podsakoff et al., 2024). To reduce common method artefacts procedurally, the survey emphasized anonymity, clarified that there were no right or wrong answers, and used clear, non-leading item phrasing to reduce social desirability and evaluation apprehension (Podsakoff et al., 2024).

Data analysis was conducted using SmartPLS following a two-step procedure that first evaluates the measurement model and then estimates the structural model (Hair & Alamer, 2022; Ringle et al., 2023). Indicator reliability was assessed using outer loadings, internal consistency reliability using Cronbach's alpha and composite reliability, and convergent validity using average variance extracted (AVE). Discriminant validity was evaluated using the heterotrait–monotrait ratio (HTMT), which is recommended for establishing construct distinctiveness in contemporary SEM reporting (Cheung et al., 2024; Ringle et al., 2023). Hypotheses were tested using bootstrapping to obtain significance tests for the structural paths, and model performance was assessed using explained variance (R^2) and effect sizes (f^2) to support interpretation beyond statistical significance (Hair

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& Alamer, 2022). Predictive relevance was evaluated using Q^2, and out-of-sample predictive assessment was conducted using PLSpredict where prediction-oriented evaluation was required (Hair & Alamer, 2022). Collinearity was examined using variance inflation factors (VIF) to ensure stable estimation and interpretable coefficients. Common method bias was assessed using the full collinearity VIF approach, with values below recommended thresholds indicating that common method effects were unlikely to materially bias the estimates (Kock et al., 2021; Podsakoff et al., 2024). The data screening rules described earlier were applied to protect estimation integrity under online survey conditions and to strengthen the credibility of the reported model estimates (Kock et al., 2021; Podsakoff et al., 2024).

3. RESULTS

This section reports the empirical results in four steps. It begins with descriptive statistics for the study constructs, proceeds to the assessment of the measurement model, then reports structural collinearity diagnostics, and finally presents the structural model estimates and hypothesis testing results. Table 2 summarizes the descriptive statistics for the eight latent constructs representing TOE readiness dimensions, TAM acceptance beliefs, digital technology use, and MSME outcome variables.

As shown in Table 2, the mean scores for all constructs exceed 4.00 on the five-point scale, indicating generally favorable responses across the sample. Perceived usefulness records the highest mean (M = 4.23, SD = 0.64), followed by environmental readiness (M = 4.22, SD = 0.68), while organizational performance (M = 4.04, SD = 0.67) and competitiveness (M = 4.06, SD = 0.68) report the lowest mean values among the constructs. The standard deviations range from 0.64 to 0.73, suggesting moderate dispersion, and the 95% confidence intervals remain relatively narrow across all constructs (N = 404).

Following the descriptive overview, the measurement model was evaluated prior to structural estimation. Table 3 reports internal consistency and convergent validity metrics. Cronbach's alpha values range from 0.880 to 0.946, rho_A values range from 0.887 to 0.958, and composite reliability values range from 0.899 to 0.977. Average variance extracted (AVE) values range from 0.647 to 0.815. These results indicate satisfactory internal consistency and convergent validity across all constructs.

Table 3. Quality criteria

Construct	Cronbach's α	rho_A	Composite Reliability (CR)	AVE
TR	0.894	0.903	0.927	0.679
ORG	0.946	0.958	0.977	0.815
ENV	0.880	0.887	0.899	0.647
PE	0.904	0.910	0.933	0.703
PU	0.924	0.935	0.956	0.753
DTU	0.915	0.920	0.945	0.729
OP	0.925	0.938	0.952	0.756
COMP	0.910	0.917	0.930	0.717

Note: TR = Technological readiness; ORG = Organizational readiness; ENV = Environmental readiness; PE = Perceived ease of use; PU = Perceived usefulness; DTU = Digital technology use; OP = Organizational performance; COMP = Competitiveness.

Discriminant validity was then assessed to confirm that each construct is empirically distinct from the others before interpreting the structural relationships. Using the Fornell–Larcker criterion, Table 4 shows that the square roots of AVE on the diagonal exceed the corresponding inter-construct correlations, supporting discriminant

Table 2. Descriptive statistics

Construct	Min	Max	Mean	SD	SE	95% CI (LL)	95% CI (UL)
Technological readiness (TR)	1.00	5.00	4.14	0.73	0.036	4.069	4.211
Organizational readiness (ORG)	1.00	5.00	4.14	0.71	0.035	4.071	4.209
Environmental readiness (ENV)	1.00	5.00	4.22	0.68	0.034	4.154	4.286
Perceived ease of use (PE)	1.00	5.00	4.13	0.69	0.034	4.063	4.197
Perceived usefulness (PU)	1.00	5.00	4.23	0.64	0.032	4.168	4.292
Digital technology use (DTU)	1.00	5.00	4.15	0.65	0.032	4.087	4.213
Organizational performance (OP)	1.00	5.00	4.04	0.67	0.033	3.975	4.105
Competitiveness (COMP)	1.00	5.00	4.06	0.68	0.034	3.994	4.126

Table 4. Discriminant validity

Construct	TR	ORG	ENV	PE	PU	DTU	OP	COMP
TR	0.824							
ORG	0.450 (0.559)	0.903						
ENV	0.680 (0.800)	0.540 (0.669)	0.804					
PE	0.593 (0.697)	0.583 (0.737)	0.422 (0.603)	0.838				
PU	0.539 (0.672)	0.308 (0.422)	0.510 (0.681)	0.482 (0.645)	0.868			
DTU	0.362 (0.501)	0.688 (0.822)	0.473 (0.646)	0.614 (0.747)	0.326 (0.473)	0.854		
OP	0.362 (0.490)	0.633 (0.832)	0.416 (0.594)	0.380 (0.486)	0.680 (0.792)	0.349 (0.460)	0.869	
COMP	0.323 (0.506)	0.385 (0.562)	0.545 (0.652)	0.506 (0.637)	0.686 (0.843)	0.498 (0.601)	0.519 (0.694)	0.847

Note: TR = Technological readiness; ORG = Organizational readiness; ENV = Environmental readiness; PE = Perceived ease of use; PU = Perceived usefulness; DTU = Digital technology use; OP = Organizational performance; COMP = Competitiveness.

validity across the measurement model (Fornell & Larcker, 1981). In addition, the HTMT ratios reported in parentheses remain below the recommended threshold of 0.85, providing further evidence that the constructs capture conceptually different domains rather than overlapping measurement content (Henseler et al., 2015).

Before testing the structural paths, collinearity among the predictor constructs was assessed. As presented in Table 5, the VIF values range from 1.000 to 2.457. For digital technology use, the VIF values of the predictor constructs range from 1.538 to 2.457, while the predictors of competitiveness show VIF values of 1.000 and 1.215. These values indicate that multicollinearity is not a material concern in the structural model.

Table 6 reports the direct effects and hypothesis testing results for the proposed model. Organizational readiness has a positive and significant effect on digital technology use ($\beta = 0.425$, $t = 12.196$, $p < 0.001$), thereby supporting H2. Perceived usefulness also shows a positive and significant effect on digital technology use ($\beta = 0.807$, $t = 17.706$, $p < 0.001$), supporting H4. By contrast, technological readiness does not significantly influence digital technology use ($\beta = 0.051$, $t = 1.670$, $p = 0.095$), and environmental readiness also does not show a significant effect

Table 5. Structural collinearity

Endogenous construct	Predictor	VIF
Digital technology use (DTU)	Technology readiness (TR)	1.724
	Organizational readiness (ORG)	2.281
	Environmental readiness (ENV)	1.538
	Perceived usefulness (PU)	2.457
Perceived usefulness (PU) Organizational performance (OP) Competitiveness (COMP)	Perceived ease of use (PE)	1.000
	Digital technology use (DTU)	1.212
	Digital technology use (DTU)	1.215
	Organizational performance (OP)	1.000

Table 6. Direct effects and hypothesis testing

Hypothesis	Structural path	Original Sample (O)	*t*-value	*p*-value	Decision
H1	TR → DTU	0.051	1.670	0.095	Not supported
H2	ORG → DTU	0.425	12.196	0.001	Supported
H3	ENV → DTU	–0.014	–0.455	0.649	Not supported
H4	PU → DTU	0.807	17.706	0.001	Supported
H5	PE → PU	0.688	13.989	0.001	Supported
H6	DTU→ OP	0.680	12.863	0.001	Supported
H7	DTU → COMP	0.672	10.203	0.001	Supported
H8	OP → COMP	0.133	2.278	0.023	Supported

Note: TR = Technological readiness; ORG = Organizational readiness; ENV = Environmental readiness; PE = Perceived ease of use; PU = Perceived usefulness; DTU = Digital technology use; OP = Organizational performance; COMP = Competitiveness.

http://dx.doi.org/10.21511/ppm.24(2).2026.33

(β = −0.014, t = −0.455, p = 0.649), so H1 and H3 are not supported.

Perceived ease of use has a positive and significant effect on perceived usefulness (β = 0.688, t = 13.989, $p < 0.001$), supporting H5. Digital technology use is positively associated with organizational performance (β = 0.680, t = 12.863, $p < 0.001$) and competitiveness (β = 0.672, t = 10.203, $p < 0.001$), thereby supporting H6 and H7. Organizational performance also exerts a positive and significant effect on competitiveness (β = 0.133, t = 2.278, p = 0.023), supporting H8. Overall, six of the eight proposed hypotheses are supported, while two are rejected.

4. DISCUSSION

This study sheds light on why digital transformation produces uneven outcomes among Indonesian micro, small, and medium-sized enterprises (MSMEs). The findings indicate that the benefits of digitalization depend less on digital adoption itself and more on whether organizational readiness and technology acceptance beliefs are translated into sustained, routinized digital technology use. In this sense, routinized use emerges as the central behavioral mechanism through which digital transformation enhances organizational performance and, ultimately, competitiveness (Nohong et al., 2026). At the same time, the results reveal that readiness dimensions do not contribute uniformly, as only organizational readiness remains significant, whereas technological readiness and environmental readiness do not.

A central finding is the positive and significant effect of organizational readiness on digital technology use. This indicates that managerial commitment, workforce capability, access to training, and the existence of internal routines are more decisive for sustained use than the mere presence of digital tools. This result is consistent with prior studies showing that internal capability and managerial support are critical for MSME digitalization, particularly when decision-making authority and operational responsibility are concentrated among a small number of actors (Kurniawati et al., 2021; Widyastuti et al., 2023; Aminullah et al., 2024). It also aligns with capability-based arguments that the value of resources depends on how they are organized into routines that support execution and adaptation (Barney, 1991; Teece et al., 1997). The present study extends that literature by showing that organizational readiness remains the most binding readiness condition even when technological and environmental factors are assessed simultaneously. In practical terms, MSMEs appear unlikely to routinize digital use unless owners and managers deliberately allocate time, assign responsibility, and stabilize simple procedures that reduce dependence on ad hoc effort.

Another important finding concerns the role of technology acceptance beliefs. Perceived usefulness emerges as the strongest direct predictor of digital technology use, while perceived ease of use significantly strengthens perceived usefulness. This suggests that routinized use depends not only on whether MSMEs possess enabling conditions, but also on whether digital tools are experienced as visibly valuable in day-to-day business activity. This pattern is consistent with TAM-based studies showing that usefulness is often the dominant driver of sustained engagement, whereas ease of use supports continued use by reducing friction and reinforcing perceived value (Davis, 1989; Venkatesh et al., 2003; Chatterjee et al., 2021; Cho et al., 2022; Hashimy et al., 2022). However, the present findings add sharper nuance by showing that usefulness is especially influential when the dependent variable is routinized business use rather than general adoption intention. In MSME settings, this likely reflects the pragmatic character of technology decisions, since firms are more willing to persist with digital tools when they can observe concrete benefits such as faster response times, improved customer follow-up, more efficient promotion, or smoother operational coordination.

By contrast, technological readiness and environmental readiness do not have statistically significant direct effects on digital technology use once organizational readiness and acceptance beliefs are included in the model. This result differs from studies that find positive effects of infrastructure availability and external pressure on digital adoption, especially in adoption-oriented TOE research (Ekasari et al., 2021; Setiyani & Rostiani, 2021; Chittipaka et al., 2022). At the same time, it is more consistent with evidence suggesting that

readiness dimensions may operate heterogeneously and may be necessary yet insufficient when the main bottleneck lies inside the firm (Kurniawati et al., 2021; N'Dri & Su, 2024). A plausible explanation is that this study focuses on routinized use rather than initial adoption. Under such conditions, baseline access to smartphones, connectivity, and platforms may already be widespread enough to function as threshold conditions rather than key differentiators. Likewise, environmental encouragement may be important for entry into the digital ecosystem, but its marginal contribution may weaken once firms have already adopted digital tools and the central challenge becomes the internal work of routinization.

The results further show that digital technology use positively influences organizational performance and competitiveness, while organizational performance also strengthens competitiveness. These findings indicate that routinized use first improves internal business functioning and then contributes to a stronger market position. This result is consistent with studies linking digital engagement to better financial, operational, and sustainability-related outcomes in MSMEs (Purba et al., 2021; Gao et al., 2023; Wirdiyanti et al., 2023). It also aligns with research suggesting that competitiveness improves when digital practices support responsiveness, differentiation, and value creation in ways that are difficult to replicate (Putritamara et al., 2023; Martín-Rojas et al., 2023; Widyastuti et al., 2023; Hassan et al., 2024; Merín-Rodrigáñez et al., 2024). The present study contributes by clarifying the ordering of these effects. Rather than assuming that digitalization directly and immediately strengthens competitiveness, the evidence suggests that competitiveness is reinforced partly because routinized digital use first improves organizational performance, which then provides the operational foundation for more durable competitive gains.

Taken together, these findings support a mechanism-centered interpretation of MSME digitalization. The study shows that readiness conditions and acceptance beliefs do not contribute equally, and that the crucial issue is whether firms can convert digital resources and favorable beliefs into repeated, embedded business practice (Devaraj & Kohli, 2003; Burton-Jones & Grange, 2013; Chatterjee et al., 2021; Hassan et al., 2024; Nohong et al., 2026; Hakim et al., 2026). This interpretation is broadly consistent with effective use research and with recent MSME digital transformation studies, which suggest that firms with similar access conditions may still experience different outcomes depending on how digital tools are integrated into everyday operations and decision routines (Devaraj & Kohli, 2003; Burton-Jones & Grange, 2013; Martín-Rojas et al., 2023; Merín-Rodrigáñez et al., 2024; Widyastuti et al., 2023). For MSME owners and managers, this implies that the priority is not only to adopt digital tools, but also to formalize recurring digital routines, assign clear responsibility, and monitor repeated indicators of use in key workflows, since digital value creation depends on continuity and organizational embedding rather than initial uptake alone (Barney, 1991; Teece et al., 1997; Hassan et al., 2024). For policy makers and support agencies, the findings suggest that program success should be assessed not only through adoption counts, but also through continuity of use, workflow integration, and visible business gains that signal routinization. This is consistent with broader concerns in MSME digitalization policy about uneven digital outcomes across firms and contexts (OECD, 2021; World Bank, 2021; Kurniawati et al., 2021).

Finally, the findings point to several directions for future research. Longitudinal designs would be especially valuable for tracing how routinized use develops over time and when it becomes strong enough to produce durable performance and competitiveness gains, particularly because digital transformation is an evolving organizational process rather than a one-time adoption event (Verhoef et al., 2021; Kraus et al., 2022; Burton-Jones & Grange, 2013). Future studies could also compare sectors, firm maturity levels, and bundles of digital tools to determine whether the mechanism identified here varies across different MSME contexts, as prior research has shown substantial heterogeneity in how digitalization is enacted and translated into business outcomes (OECD, 2021; World Bank, 2021; Ben Slimane et al., 2022; Sagala & Őri, 2024). Such work would deepen understanding of when readiness conditions remain constraining and when perceived usefulness becomes the decisive force behind sustained digital engagement in MSMEs (Davis, 1989; Venkatesh et al., 2003; Chatterjee et al., 2021; Cho et al., 2022).

http://dx.doi.org/10.21511/ppm.24(2).2026.33

CONCLUSION

The purpose of this study was to examine whether digital readiness conditions and technology acceptance beliefs help Indonesian MSMEs translate digitalization into stronger organizational outcomes through routinized digital technology use. The results show that not all antecedents play the same role in this process. Organizational readiness and perceived usefulness were the only factors that directly strengthened routinized use of digital technology, whereas perceived ease of use contributed indirectly through perceived usefulness. By contrast, technological readiness and environmental readiness did not explain routinized use once internal capability and perceived value were taken into account. The findings also show that routinized digital technology use is positively associated with organizational performance and competitiveness, and that stronger organizational performance further reinforces competitiveness.

These results lead to the conclusion that the business value of digital transformation in MSMEs depends less on digital adoption as a formal milestone and more on whether digital tools become embedded in recurring business practice. In other words, MSMEs gain more from digitalization when digital resources are converted into stable routines that support execution, coordination, and market responsiveness. This suggests that the central challenge in MSME digitalization is not simply expanding access to digital tools, but ensuring that such tools become operationally meaningful in everyday work.

Further research should extend this explanation by tracing how routinized digital use develops over time and under what conditions it becomes strong enough to produce durable gains in performance and competitiveness. Longitudinal research, multi-informant designs, and the use of more objective business indicators would help strengthen causal inference and reduce the limitations of single-respondent survey evidence. Future studies could also examine whether the mechanism identified here varies across sectors, levels of business maturity, and different bundles of digital technologies in MSME settings.

AUTHOR CONTRIBUTIONS

Conceptualization: Meirani Harsasi, Isbandriyati Mutmainah.
Data curation: Aprihatiningrum Hidayati, Erni Ernawati.
Formal analysis: Meirani Harsasi.
Investigation: Aprihatiningrum Hidayati, Erni Ernawati.
Methodology: Meirani Harsasi, Isbandriyati Mutmainah.
Project administration: Meirani Harsasi.
Resources: Aprihatiningrum Hidayati, Erni Ernawati.
Software: Meirani Harsasi.
Supervision: Meirani Harsasi, Isbandriyati Mutmainah.
Validation: Isbandriyati Mutmainah.
Visualization: Aprihatiningrum Hidayati.
Writing – original draft: Meirani Harsasi.
Writing – review & editing: Meirani Harsasi, Isbandriyati Mutmainah, Aprihatiningrum Hidayati, Erni Ernawati.

ACKNOWLEDGMENT

This article was funded by the Indonesian Endowment Fund for Education (LPDP), Ministry of Finance of the Republic of Indonesia, through the EQUITY WCU (Enhancing Quality Education for International University Recognition – World Class University) program, Ministry of Higher Education, Science and Technology, administered by Universitas Terbuka. We also thank all participating MSME respondents for their time and insights. Ethical approval was obtained from the relevant institutional committee, and all

participants provided informed consent. We gratefully acknowledge the use of ChatGPT (OpenAI, 2025 version) to support language refinement and grammar improvement during manuscript preparation. The tool was used exclusively for copy-editing to enhance linguistic clarity and readability. No part of the research design, data collection, data analysis, interpretation of results, or substantive content was generated by AI. We take full responsibility for the accuracy, integrity, and originality of the work.

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APPENDIX A

Table A1. Constructs and measurement items

Construct	Definition	Code	Item statements	Source
Technological readiness	Maturity of technology resources and technical feasibility for business use, including infrastructure and compatibility	TR	**TR1** We use digital technology that is compatible with our current business processes. **TR2** We have adequate digital infrastructure to support day-to-day operations. **TR3** We integrate digital tools into core business activities such as sales, payments, or inventory. **TR4** We understand how to use digital technology to support business decisions and operations.	Ekasari et al. (2021); Setiyani and Rostiani (2021)
Organizational readiness	Internal capability to support sustained use, including resources, management support, and training	ORG	**ORG1** We have sufficient digital skills to use digital technology for our business needs. **ORG2** We receive active support from the owner or management to use digital technology. **ORG3** We have access to training or learning opportunities related to digital technology use. **ORG4** We have work roles and routines that support consistent digital technology use in daily operations.	Setiyani and Rostiani (2021); Ekasari et al. (2021)
Environmental readiness	External conditions that encourage or enable digital use, including institutional and market influences	ENV	**ENV1** We face competitive pressure that encourages us to use digital technology. **ENV2** We benefit from government programs or policies that make it easier to use digital technology. **ENV3** We experience customer or market demand that increasingly requires us to use digital channels. **ENV4** We receive partner support that enables digital transactions and coordination with suppliers or platforms.	Ekasari et al. (2021); Setiyani and Rostiani (2021)
Perceived ease of use	Perceived effort required to learn and operate digital technology	PE	**PE1** We find it easy to learn how to use digital technology for our business. **PE2** We find it easy to use digital technology for our business tasks. **PE3** We find digital technology flexible to apply across our business activities. **PE4** We find the functions and features of digital technology easy to understand.	Nugraha et al. (2022)
Perceived usefulness	Perceived performance value of digital technology for business outcomes	PU	**PU1** We find that digital technology improves the efficiency of our operations. **PU2** We find that digital technology helps us expand our market reach. **PU3** We find that digital technology helps us improve service quality for customers. **PU4** We find that digital technology helps increase our sales performance.	Nugraha et al. (2022)
Digital Technology Use	Actual, sustained utilization of digital technology in business operations	DTU	**DTU1** We use digital technology intensively in our daily business operations. **DTU2** We allocate resources or investment to support the continued use of digital technology. **DTU3** We use digital technology in ways that are aligned with our business objectives. **DTU4** We consistently continue using digital technology as part of our core business processes.	Sigalingging and Sinaga (2025); Setiyani and Rostiani (2021); Kurniawati et al. (2021)
Organizational Performance	Business outcomes including financial and operational aspects	OP	**OP1** We have experienced improved sales performance over the recent period. **OP2** We have experienced improved operational efficiency through the use of digital technology. **OP3** We have experienced improved profitability over the recent period. **OP4** We have experienced expanded market reach through digital channels over the recent period.	Gao et al. (2023)
Competitiveness	Capability to maintain and improve market position	COMP	**COMP1** We have a stronger competitive advantage than key competitors. **COMP2** We respond faster to customer needs than competitors. **COMP3** We provide more innovative products or services than competitors. **COMP4** We are more resilient and able to endure competition in a dynamic market.	Roostika (2019); Putritamara et al. (2023)