
From Useful to Used? Contextual Pressures in AI Adoption

Jim Jesse te Loo

Amsterdam Business School, University of Amsterdam
Plantage Muidergracht 12, Amsterdam, 1018TV, The Netherlands.
E-mail: jim.te.loo@student.uva.nl

Frederik Situmeang*

Marketing Section, Amsterdam University of Applied Sciences
Fraijlemaborg 133, Amsterdam, 1102CV, The Netherlands.
Amsterdam Business School, University of Amsterdam
Plantage Muidergracht 12, Amsterdam, 1018TV, The Netherlands.
E-mail f.b.i.situmeang@hva.nl, f.b.situmeang@uva.nl

* Corresponding author

Abstract: This study examines the adoption of AI-driven decision-making in small and medium-sized enterprises (SMEs), addressing the paradox that adoption remains limited despite increasing knowledge availability. Building on the Technology Acceptance Model, we propose a serial mediation model in which knowledge availability influences adoption intention through perceived ease of use and perceived usefulness. Using survey data from 232 SME decision-makers, the results support a full mediation structure, indicating that knowledge does not directly translate into adoption but operates through cognitive evaluations, particularly perceived usefulness. In addition, data availability and time pressure positively influence adoption intention, while regulation ambiguity shows no significant effect. Moderation analysis reveals that time pressure weakens the relationship between knowledge availability and adoption intention, suggesting that temporal constraints limit the enactment of organizational capability. The findings highlight the importance of contextual pressures in explaining AI adoption in SMEs and extend technology adoption theory beyond purely cognitive determinants.

Keywords: Artificial intelligence; Data-driven decision-making; SMEs; Technology adoption; Perceived usefulness; Time pressure; Knowledge availability; Regulation ambiguity; Decision-making processes

Word Count: 5241 excluding Tables and List of References

1 Problem

The adoption of artificial intelligence (AI) and data-driven decision-making in small and medium-sized enterprises (SMEs) remains limited, despite increasing availability of AI tools, data infrastructure, and knowledge resources. This is problematic, as AI has the potential to significantly enhance strategic decision-making by supporting information

processing, generating insights, and improving the evaluation of alternatives (Dwivedi et al., 2023).

This issue is particularly relevant for SMEs, where strategic decisions are often concentrated in a small number of decision-makers and shaped by resource constraints such as limited time, limited analytical support, and restricted access to expertise (Dörr et al., 2024). In such contexts, AI and data-driven tools could provide substantial value by reducing cognitive effort and enabling more structured decision-making.

However, empirical evidence shows that SMEs adopt AI at significantly lower rates than large firms (OECD, 2025). The OECD report states that “while 40% of firms with 250 or more employees were using AI in 2024, only 20.4% of firms between 50 and 249 employees and only 11.9% of firms between 10 and 49 employees used AI.” This creates a central paradox, i.e. even when SMEs increasingly possess knowledge and access to AI technologies, these technologies are not widely used in strategic decision-making. Understanding why this gap persists is critical for both theory and practice in innovation management.

2 Current Understanding

Technology adoption research provides a well-established foundation for explaining why individuals and organizations adopt new technologies. The Technology Acceptance Model (TAM) posits that perceived usefulness (PU) and perceived ease of use (EoU) are the primary determinants of behavioral intention (Davis, 1989). Extensions of TAM to intelligent systems reaffirm the centrality of these cognitive evaluations while accounting for characteristics such as opacity and autonomy in AI-based systems (Vorm & Combs, 2022). Within this perspective, adoption is expected when users perceive a technology as useful and easy to use.

In parallel, research highlights the growing role of artificial intelligence (AI) in supporting managerial and strategic decision-making. AI systems enable the processing of large volumes of information, support the evaluation of alternatives, and enhance decision quality and efficiency (Dwivedi et al., 2023; Rajaram & Tinguely, 2024). Importantly, AI does not merely support decisions but can reshape how decisions are made by redistributing cognitive effort between humans and algorithms (Shrestha et al., 2019). From an organizational perspective, AI can therefore be understood as a form of cognitive augmentation that structures decision processes and reduces information-processing demands. These capabilities are particularly relevant for small and medium-sized enterprises (SMEs), where decision-making is often centralized and constrained by limited resources (Dörr et al., 2024).

Despite these theoretical expectations, empirical evidence shows that AI adoption in SMEs remains substantially lower than in larger firms (OECD, 2025). Prior research has primarily attributed this gap to capability constraints, such as limited technical expertise, financial resources, or data infrastructure (OECD, 2025). This perspective assumes that non-adoption is driven by an inability to adopt.

However, this explanation is increasingly insufficient. The growing availability of accessible AI tools and external service providers suggests that basic knowledge and

access are no longer the primary bottlenecks in many SME contexts. Yet, adoption remains limited. This indicates that the determinants of adoption extend beyond capability constraints and raises the question of why technologies that are perceived as useful are not consistently used.

A key limitation of existing adoption models is their implicit assumption of relatively stable decision environments. TAM and related frameworks focus on individual cognitive evaluations while abstracting from the conditions under which decisions are made. This becomes problematic in SME contexts, where strategic decision-making is inherently time-constrained, uncertain, and embedded in organizational and institutional pressures.

In such environments, the translation of perceived usefulness into adoption cannot be assumed to be straightforward. Decision-makers must not only evaluate whether AI is useful, but also whether its use is feasible, interpretable, and defensible under contextual constraints. Factors such as time pressure, data availability, and regulatory ambiguity shape the conditions under which AI is applied, influencing both the perceived risks and the practical feasibility of adoption.

Taken together, existing literature provides strong insights into the cognitive determinants of technology adoption and the role of AI in reshaping decision-making processes. However, it offers limited understanding of how contextual pressures influence the translation of these evaluations into actual adoption behavior. This suggests that current models are incomplete when applied to SME strategic decision-making, as they do not sufficiently account for the interaction between capability, cognition, and context.

3 Research Question and Theoretical Framework

Building on the limitations identified in existing adoption models, this study examines AI adoption in SMEs as a context-dependent decision process. While the Technology Acceptance Model (TAM) emphasizes perceived ease of use (EoU) and perceived usefulness (PU) as key drivers of adoption (Davis, 1989; Vorm & Combs, 2022), these cognitive evaluations alone are insufficient to explain adoption in strategic SME contexts.

AI-driven decision-making differs from traditional IT use in that it actively shapes how decisions are structured and evaluated, redistributing cognitive effort between humans and algorithms (Shrestha et al., 2019). As such, adoption depends not only on whether AI is perceived as useful, but also on whether decision-makers are able to integrate it into their decision processes under contextual constraints.

This study proposes a multi-layered framework in which AI adoption is determined by the interaction between capability, cognition, and context. At the capability level, knowledge availability enables decision-makers to engage with AI and reduces perceived effort, thereby influencing Ease of Use. At the cognitive level, Ease of Use shapes Perceived Usefulness, which in turn drives adoption intention. At the contextual level, conditions such as time pressure, data availability, and regulation ambiguity shape whether perceived usefulness translates into adoption.

Time pressure plays a dual role, acting as both a direct driver of adoption and a boundary condition that constrains the use of available knowledge. Data availability functions as a feasibility condition for AI application, while regulation ambiguity introduces uncertainty that may discourage adoption. Accordingly, the central research question is formulated as follows:

To what extent do knowledge availability and contextual constraints explain the adoption of AI-driven decision-making in SMEs, and how does time pressure influence the relationship between perceived usefulness and adoption intention?

Hypotheses Development

Knowledge availability constitutes a foundational enabler in the adoption of AI-driven decision-making, particularly in SME contexts where formal analytical support structures are limited. Prior research has traditionally framed knowledge as a constraint, suggesting that low adoption is primarily driven by lack of skills or expertise (OECD, 2025). However, this study departs from that assumption by focusing on contexts in which knowledge is increasingly available but not fully translated into use. In such settings, knowledge plays a different role: not as a barrier to access, but as a mechanism shaping how technologies are cognitively processed.

From a cognitive perspective, knowledge availability reduces uncertainty about how AI systems function, what inputs are required, and how outputs should be interpreted. This reduction in uncertainty lowers the perceived cognitive effort associated with interacting with AI systems. In line with learning theory and technology acceptance literature, users who are more familiar with a technology or its underlying principles are better able to form mental models of its operation, which enhances their perception of ease of use (Davis, 1989). In SME settings, where decision-makers often lack dedicated technical support, such cognitive simplification is particularly important, as technologies that require substantial effort to understand or operate are less likely to be integrated into already constrained workflows.

This relationship reflects a capability-to-cognition mechanism: knowledge availability enables individuals to perceive AI as manageable and accessible, rather than complex and opaque. As a result, even when knowledge is not a binding constraint, variation in knowledge availability is expected to shape how easily AI can be used in practice.

H1: Knowledge availability is positively related to the Perceived Ease of Use (EoU) of AI-driven decision-making in SMEs.

Perceived ease of use plays a central role in shaping perceived usefulness, particularly in environments characterized by limited time and cognitive resources. According to TAM, ease of use influences usefulness because technologies that require less effort are more likely to enhance performance outcomes (Davis, 1989). This relationship becomes even more pronounced in SME contexts, where decision-makers must balance multiple roles and operate under resource constraints (Dörr et al., 2024).

In such environments, usefulness is not evaluated in isolation, but in relation to the effort required to achieve outcomes. A system that is theoretically powerful but difficult to use may be perceived as less useful in practice, because the cognitive and temporal costs outweigh the expected benefits. Conversely, AI systems that are intuitive and require

minimal effort to operate are more likely to be integrated into decision-making processes, thereby enhancing their perceived value.

This suggests that perceived ease of use acts as a cognitive amplifier of usefulness, particularly in SME settings where efficiency is critical. The easier it is to interact with AI, the more likely decision-makers are to recognize its practical benefits in supporting strategic tasks such as information synthesis, scenario evaluation, and planning.

H2: Perceived Ease of Use (EoU) is positively related to the Perceived Usefulness (PU) of AI-driven decision-making in SMEs.

Perceived usefulness reflects the extent to which AI enhances decision-making outcomes. In the context of AI-driven decision-making, usefulness is not limited to efficiency gains but also relates to how AI contributes to structuring decisions and evaluating alternatives (Shrestha et al., 2019). Usefulness extends beyond efficiency gains to include enhanced analytical depth, improved structuring of complex information, and support in evaluating strategic alternatives (Dwivedi et al., 2023; Rajaram & Tinguely, 2024).

In SMEs, where decision-making authority is often concentrated in a small number of individuals, the perceived value of decision-support tools is closely tied to their ability to directly improve business outcomes. Decision-makers are likely to adopt AI when they believe it leads to better decisions, faster insights, or clearer strategic direction. This aligns with the core TAM proposition that perceived usefulness is the strongest predictor of behavioral intention.

However, in SME contexts, usefulness is evaluated pragmatically and under constraints. Technologies are not adopted based on abstract potential, but on their perceived contribution to immediate decision needs. As such, when AI is perceived as meaningfully enhancing decision-making effectiveness, adoption intention is expected to increase.

H3: Perceived Usefulness (PU) is positively related to the Intention to adopt AI-driven decision-making in SMEs.

While cognitive evaluations such as perceived usefulness are central to technology adoption, their translation into actual use depends on the availability of complementary resources. In the case of AI-driven decision-making, data availability is a critical enabling condition, as AI systems rely on relevant, structured, and accessible data to generate meaningful outputs. Prior research highlights that the effectiveness of AI applications is inherently dependent on the quality and availability of underlying data, which determines whether AI can be meaningfully applied to organizational decision-making (Dwivedi et al., 2023; Rajaram & Tinguely, 2024; Shrestha et al., 2019).

In SME contexts, data-related constraints are particularly pronounced. SMEs often lack integrated data infrastructures and may rely on fragmented or manually maintained data sources, limiting the feasibility of implementing AI solutions (OECD, 2025). As a result, even when decision-makers possess sufficient knowledge and perceive AI as useful, the absence of adequate data reduces the practical applicability of AI-driven decision-making. This suggests that data availability operates as a contextual feasibility condition, directly influencing whether adoption is possible in practice.

H4: Data availability is positively related to the Intention to adopt AI-driven decision-making in SMEs.

In addition to technical feasibility, institutional uncertainty plays a critical role in shaping AI adoption decisions. Regulation ambiguity refers to uncertainty regarding the legal, ethical, and compliance implications of using AI systems in organizational decision-making. In the context of AI, such ambiguity is particularly salient due to the rapid evolution of technologies and the lag in regulatory frameworks governing their use (Dwivedi et al., 2023).

From a decision-making perspective, regulation ambiguity introduces perceived risk, as decision-makers face uncertainty about the potential consequences of relying on AI. This is especially relevant in SMEs, where decision-making authority is concentrated, and individuals are directly accountable for outcomes. In such settings, the inability to clearly assess whether AI use complies with existing or future regulations may lead decision-makers to adopt a cautious stance, avoiding reliance on AI even when it is perceived as beneficial.

Thus, regulation ambiguity functions as a risk-enhancing contextual constraint, weakening the willingness to adopt AI-driven decision-making by increasing uncertainty around its consequences.

H5: Regulation ambiguity is negatively related to the Intention to adopt AI-driven decision-making in SMEs.

Time pressure is a defining characteristic of SME decision-making environments, reflecting the perception of insufficient time to complete tasks and the need to make decisions under urgency. SMEs typically operate with limited managerial capacity, requiring decision-makers to handle multiple responsibilities simultaneously, which constrains the time available for analysis and deliberation.

As a contextual factor, time pressure shapes the extent to which decision-makers rely on tools that can support rapid information processing. On the one hand, AI-driven decision-making tools may become more attractive under time pressure, as they promise to accelerate analysis and reduce cognitive effort. On the other hand, time pressure also limits the ability of decision-makers to explore, learn, and integrate new technologies into their workflows. This suggests that time pressure has a direct but theoretically ambiguous relationship with adoption intention, as it simultaneously creates demand for efficiency while constraining the capacity for adoption.

H6: Time pressure is positively related to the Intention to adopt AI-driven decision-making in SMEs.

Beyond its direct effect, time pressure plays a critical role in shaping how decision-makers translate available resources into action. While knowledge availability reflects the presence of organizational capability, its influence on adoption intention depends on the conditions under which decisions are made.

Under conditions of low time pressure, decision-makers have greater capacity to draw on available knowledge, explore how AI can be applied, and integrate this understanding into their decision processes. In such contexts, knowledge availability is more likely to translate into adoption intention. However, under high time pressure, decision-making shifts toward more heuristic and intuitive processing, limiting the depth of cognitive evaluation. Under such conditions, decision-makers are less likely to actively mobilize available knowledge and instead rely on familiar routines or simplified decision

strategies. As a result, even when knowledge about AI is available, high time pressure may constrain its translation into actual adoption intention.

H7: Time pressure negatively moderates the relationship between knowledge availability and the intention to adopt AI-driven decision-making, such that the relationship is weaker under high time pressure.

4 Research Design

Research Approach and Sample

This study employs a quantitative, cross-sectional survey design to test the proposed theoretical model of AI-driven decision-making adoption in SMEs. A survey-based approach is appropriate given the study's objective to examine relationships between latent constructs such as perceived usefulness, perceived ease of use, and contextual pressures across a broader population of decision-makers.

The target population consists of SME decision-makers, including founders, owners, and senior managers who are directly involved in strategic decision-making processes. This focus is consistent with prior research emphasizing that decision-making authority in SMEs is often concentrated in a limited number of individuals, making their perceptions particularly relevant for understanding technology adoption behavior.

Data are collected through an online questionnaire distributed via professional networks, industry contacts within a Dutch research consortium project on Digitalization of SMEs. There are 250 respondents in the sample, and 232 responses are fully completed and used in the research.

Measurement of Constructs

All constructs in this study are operationalized as reflective latent variables and measured using multi-item scales. Respondents indicate their agreement with each statement on a seven-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). This approach is consistent with prior research on technology adoption and organizational perceptions.

Perceived Ease of Use (EoU), *Perceived Usefulness (PU)*, and *Intention to Adopt AI-driven decision-making* are measured using established scales adapted from the Technology Acceptance Model (Davis, 1989) and its extensions to intelligent systems (Vorm & Combs, 2022). Items are contextualized to reflect the use of AI in strategic decision-making rather than general IT usage.

Perceived knowledge availability captures the extent to which organizations possess the expertise and capabilities required to use AI. The measurement items are adapted from Chwelos, Benbasat, and Dexter (2001), who conceptualize organizational readiness in terms of the availability of knowledge and human capabilities necessary for technology adoption. In this study, the items are contextualized to AI by focusing on employee

expertise, access to skilled personnel, and the organization's ability to apply AI in decision-making processes.

Perceived data availability refers to the extent to which organizations possess sufficient, accessible, and usable data to support AI-driven decision-making. The measurement items are adapted from Zhu, Kraemer, and Xu (2006), who conceptualize firm-level technological readiness through the availability of resources and infrastructure. In line with this perspective, the items are tailored to AI by emphasizing the sufficiency, accessibility, and usability of data for analytical and decision-support purposes.

Perceived regulation ambiguity captures the extent to which decision-makers perceive AI-related regulations as unclear, difficult to interpret, and unpredictable. The measurement items are adapted from literature on perceived environmental uncertainty and innovation adoption complexity. These dimensions are contextualized to AI by focusing on difficulties in identifying applicable regulations, interpreting legal requirements, and anticipating regulatory changes.

Time pressure is operationalized as the perceived urgency and lack of sufficient time to perform decision-making tasks. Measurement items are adapted from prior research on temporal constraints and perceived time scarcity (e.g., Que et al., 2019), capturing the extent to which decision-makers experience urgency, time limitations, and pressure to make rapid decisions in their organizational context.

Analytical Strategy

The hypotheses are tested using ordinary least squares (OLS) regression-based path analysis with Hayes' PROCESS macro (Hayes, 2022). This approach is appropriate because the proposed framework contains both a serial mediation structure and a moderation effect, which can be estimated efficiently using PROCESS.

First, the indirect mechanism through which organizational capability translates into adoption intention is examined using PROCESS Model 6, which is designed for serial mediation analysis. In this study, the model tests whether knowledge availability is associated with the intention to adopt AI-driven decision-making through the sequential mediating roles of perceived ease of use and perceived usefulness.

Second, the boundary condition proposed in the theoretical framework is tested using PROCESS Model 15. This is used to test whether time pressure moderates the relationship between knowledge availability and adoption intention, and to assess whether this moderation extends to the relationship between perceived usefulness and adoption intention.

5 Findings

Reliability Analysis, Descriptives and Correlation

All constructs demonstrate satisfactory reliability, with Cronbach's alpha values exceeding the .70 threshold. Descriptive statistics indicate generally high levels of

perceived usefulness, ease of use, and adoption intention, suggesting favorable evaluations of AI-driven decision-making. Regulation ambiguity shows greater variability, while time pressure indicates the presence of contextual constraints.

The correlation matrix provides initial support for the proposed relationships. Adoption intention is strongly associated with perceived usefulness, while perceived ease of use is moderately correlated with usefulness. Knowledge availability is positively related to both constructs, suggesting a mediated structure. Data availability is positively associated with adoption intention, whereas regulation ambiguity shows a small negative relationship. All correlations remain below .80, indicating no multicollinearity concerns. Furthermore, Harman's single-factor test indicated that the first factor accounted for 30.2% of the total variance, suggesting that common method bias is unlikely to substantially affect the results.

Serial Mediation Analysis

The results support the proposed serial mediation model. Knowledge availability is positively related to perceived ease of use ($\beta = .242, p < .001$), supporting **H1**. Among the covariates, only data availability shows a significant positive effect ($\beta = .220, p < .001$).

Perceived ease of use is positively related to perceived usefulness ($\beta = .435, p < .001$), supporting **H2**. Knowledge availability also has a direct positive effect on perceived usefulness ($\beta = .185, p = .001$). Data availability remains significant ($\beta = .157, p = .010$), while other covariates are not.

Perceived usefulness is strongly related to adoption intention ($\beta = .741, p < .001$), supporting **H3**. Perceived ease of use does not have a direct effect ($\beta = -.015, p = .819$), indicating an indirect role through usefulness. Knowledge availability is not directly related to adoption intention ($\beta = .034, p = .534$), suggesting full mediation in the baseline model.

Among the covariates, data availability ($\beta = .150, p = .011$) and time pressure ($\beta = .098, p = .030$) are positively related to adoption intention, supporting **H4** and **H6**. Regulation ambiguity is not significant; thus, **H5** is not supported.

The total indirect effect of knowledge availability on adoption intention is significant ($\beta = .211, 95\% \text{ CI } [.120, .325]$). The indirect effect via perceived usefulness ($\beta = .137, 95\% \text{ CI } [.053, .239]$) and the serial path via perceived ease of use and perceived usefulness ($\beta = .078, 95\% \text{ CI } [.032, .133]$) are both significant. The indirect effect via perceived ease of use alone is not significant ($\beta = -.004, 95\% \text{ CI } [-.049, .044]$). These results indicate that perceived usefulness is the primary mediating mechanism linking knowledge availability to adoption intention, while perceived ease of use contributes indirectly through its effect on perceived usefulness.

Moderation Analysis

The results show that knowledge availability has a positive and significant direct effect on adoption intention ($\beta = .565, p = .013$), while perceived usefulness remains a strong

and significant predictor ($\beta = .838, p < .001$). In addition, time pressure is positively related to adoption intention ($\beta = .733, p < .01$).

Consistent with **H7**, the interaction between knowledge availability and time pressure is negative and statistically significant ($\beta = -.093, p = .037$). The inclusion of this interaction term leads to a significant increase in explained variance ($\Delta R^2 = .008, p = .037$). In contrast, the interaction between perceived usefulness and time pressure is not statistically significant ($\beta = -.035, p = .453$).

At low levels of time pressure (16th percentile), knowledge availability has a positive and significant effect on adoption intention ($\beta = .255, p = .004$). At average levels of time pressure, the effect remains positive but weaker ($\beta = .099, p = .046$). At high levels of time pressure (84th percentile), the effect of knowledge availability on adoption intention is no longer significant ($\beta = .006, p = .936$). Therefore, the influence of knowledge availability on adoption intention diminishes as time pressure increases and becomes negligible under high time pressure conditions.

Table 1 Descriptive, Cronbach Alpha (in diagonal brackets) and Correlation Table

Variable	Mean	SD	1	2	3	4	5	6	7
1. Adoption Intention	5.459	1.203	(.940)						
2. Knowledge Availability	5.238	1.182	.414**	(.890)					
3. Ease of Use	5.411	.967	.452**	.435**	(.731)				
4. Usefulness	5.484	1.051	.746**	.466**	.571**	(.933)			
5. Time Pressure	4.734	1.271	.232**	-.012	.100	.160*	(.864)		
6. Regulation Ambiguity	4.335	1.389	-.156*	-.290**	-.160*	-.153*	.130*	(.916)	
7. Data Availability	5.142	1.088	.454**	.523**	.417**	.443**	.039	-.290**	(.890)

Table 2 Serial Mediation and Moderation Analysis

Predictor	Ease of Use	Usefulness	Adoption Intention (Model 6)	Adoption Intention (Model 15)
Knowledge Availability	.242 (.056)***	.185 (.056)**	.034 (.055)	.565 (.225)*
Ease of Use	—	.435 (.064)***	-.015 (.067)	—
Usefulness	—	—	.741 (.064)***	.838 (.234)***
Time Pressure	.052 (.048)	.092 (.047)*	.098 (.045)*	.733 (.250)**
Regulation Ambiguity	-.012 (.043)	.002 (.041)	-.025 (.040)	—
Data Availability	.220 (.061)***	.157 (.061)**	.150 (.059)**	—
Know × Time Pressure	—	—	—	-.093 (.044)*
Useful × Time Pressure	—	—	—	-.035 (.047)

*** <.001, ** <.01, * <.05

6 Contributions

This study contributes to the literature on technology adoption, innovation management, and AI in SMEs in three important ways. First, the study extends traditional technology adoption models by addressing a key limitation in existing frameworks such as the Technology Acceptance Model (TAM). Prior research assumes that when knowledge is available and a technology is perceived as useful and easy to use, adoption will follow (Davis, 1989; Vorm & Combs, 2022). However, the findings of this study show that this assumption does not hold in SME strategic decision-making contexts. Specifically, knowledge availability does not directly translate into adoption intention, but operates through cognitive mechanisms, primarily perceived usefulness. This highlights that adoption is not solely a function of capability but depends on how that capability is cognitively processed. By demonstrating a mediation and moderation model, this study refines TAM by showing that knowledge availability acts as an upstream enabler rather than a direct driver of adoption in AI-driven decision-making.

Second, this study contributes by integrating contextual pressures into the explanation of AI adoption. While prior research has focused largely on structural barriers such as lack of skills, resources, or infrastructure (OECD, 2025), this study shows that contextual conditions play a critical role even when such capabilities are present. In particular, the findings demonstrate that data availability and time pressure have direct effects on adoption intention, highlighting that feasibility and decision urgency are important determinants alongside cognitive evaluations. This shifts the focus from a purely capability-based explanation of non-adoption toward a more nuanced understanding in which adoption depends on the interaction between capability, cognition, and context. As such, the study contributes to innovation management literature by providing a more contextually grounded explanation of why AI remains underutilized in SMEs.

Third, the study contributes by identifying time pressure as a boundary condition that constrains the translation of organizational capability into adoption behavior. While prior research often assumes that contextual factors moderate cognitive evaluations, the results show that time pressure does not weaken the relationship between perceived usefulness and adoption intention. Instead, it weakens the direct effect of knowledge availability on adoption. This finding is theoretically important because it suggests that temporal constraints primarily affect the enactment of capability rather than the evaluation of technology. Under high time pressure, decision-makers are less able to mobilize available knowledge, even when they recognize the usefulness of AI. This provides a more precise understanding of how decision context shapes technology adoption and highlights the importance of distinguishing between different stages in the adoption process.

Taken together, this study advances the literature by moving beyond static and decontextualized models of technology acceptance. It proposes and empirically supports a multi-layered perspective in which AI adoption in SMEs is shaped by the interaction between knowledge-based capability, cognitive evaluation, and contextual constraints. In doing so, it offers a more comprehensive explanation of the gap between the availability of AI and its actual use in organizational decision-making.

7 Practical Implications

The findings of this study offer several implications for managers, SME decision-makers, and policymakers seeking to promote the adoption of AI-driven decision-making. First, the results suggest that increasing knowledge availability alone is insufficient to drive adoption. While many initiatives focus on training and upskilling, the findings show that knowledge does not directly translate into adoption intention but operates through perceived usefulness. This implies that organizations should not only invest in developing AI-related knowledge, but also ensure that this knowledge is translated into clear and tangible use cases. Demonstrating how AI improves decision quality, reduces effort, or enhances strategic clarity is critical for fostering adoption. In practice, this means moving beyond generic training toward application-oriented learning, such as case-based demonstrations, pilot projects, and decision-support scenarios that make the value of AI visible and actionable.

Second, the strong role of perceived usefulness indicates that adoption is driven by pragmatic evaluation rather than technological enthusiasm. SME decision-makers are likely to adopt AI when it clearly contributes to their immediate decision-making needs. Therefore, solution providers and consultants should focus on designing AI tools that are directly aligned with specific decision tasks, rather than offering generic or overly complex solutions. Emphasizing usability and integration into existing workflows can further enhance perceived usefulness by reducing the effort required to apply AI in practice.

Third, the findings highlight the importance of data availability as a key enabler of AI adoption. Even when knowledge and willingness are present, insufficient or inaccessible data limits the applicability of AI-driven decision-making. For SMEs, this implies that investments in data infrastructure, data quality, and data accessibility are essential preconditions for successful AI adoption. Policymakers and support organizations can play an important role by facilitating access to data resources, promoting data standardization, and supporting SMEs in developing basic data management capabilities.

Fourth, the results show that time pressure plays a dual role. On the one hand, time pressure increases the likelihood of adoption, suggesting that AI is perceived as a tool for improving efficiency under urgency. On the other hand, time pressure weakens the effect of knowledge availability on adoption intention, indicating that decision-makers are less able to leverage available knowledge under high temporal constraints. This implies that organizations should not assume that urgency alone will lead to effective adoption. Instead, AI solutions should be designed to be immediately usable, requiring minimal learning and interpretation. Providing intuitive interfaces, clear outputs, and low-effort integration can help ensure that AI remains actionable even under time pressure.

Finally, the absence of a significant effect of regulation ambiguity suggests that regulatory concerns may not be the primary barrier to adoption in this context. However, this does not imply that regulation is unimportant. Rather, it indicates that in the presence of more immediate constraints, such as time and data availability, regulatory uncertainty may play a secondary role. Policymakers should therefore complement regulatory efforts with practical support measures that address operational barriers to adoption.

Overall, the findings indicate that promoting AI adoption in SMEs requires a shift from focusing solely on capability development toward enabling the effective use of that capability in practice. This involves aligning knowledge, tools, data, and decision contexts in a way that allows AI to be integrated into real-world decision-making processes.

References and Notes

- Chwelos, P., Benbasat, I. and Dexter, A.S. (2001) 'Research report: Empirical test of an EDI adoption model', *Information Systems Research*, 12(3), pp. 304–321.
- Davis, F.D. (1989) 'Perceived usefulness, perceived ease of use, and user acceptance of information technology', *MIS Quarterly*, 13(3), pp. 319–340.
- Dörr, U., Schönhofer, G. and Schwarz, J.O. (2024) 'The state of foresight in small and medium enterprises: literature review and research agenda', *European Journal of Futures Research*, 12(1), Article 37.
- Dwivedi, Y.K., Kshetri, N., Hughes, L., Slade, E.L., Jeyaraj, A., Kar, A.K., Baabdullah, A.M., Koochang, A., Raghavan, V., Ahuja, M. and Albanna, H., 2023. Opinion Paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International journal of information management*, 71, p.102642.
- Hayes, A.F. (2022) *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. 3rd edn. New York: Guilford Press.
- OECD (2025) AI adoption by small and medium-sized enterprises. Paris: OECD Publishing. Available at: <https://doi.org/10.1787/426399c1-en>
- Rajaram, K. and Tinguely, P.N. (2024) 'Generative artificial intelligence in small and medium enterprises: Navigating its promises and challenges', *Business Horizons*, 67(5), pp. 629–648.
- Shrestha, Y.R., Ben-Menahem, S.M. and Von Krogh, G., 2019. Organizational decision-making structures in the age of artificial intelligence. *California management review*, 61(4), pp.66-83.
- Vorm, E. S., & Combs, D. J. (2022). Integrating transparency, trust, and acceptance: The intelligent systems technology acceptance model (ISTAM). *International Journal of Human-Computer Interaction*, 38(18-20), 1828-1845.
- Zhu, K., Kraemer, K.L. and Xu, S. (2006) 'The process of innovation assimilation by firms in different countries: A technology diffusion perspective on e-business', *Management Science*, 52(10), pp. 1557–1576.

Acknowledgement

This research Twin Green Digital Transition (RAAK.MKB20.017) is co-financed by the SIA Regieorgaan part of the Netherlands Organisation for Scientific Research (NWO).