



To cite this article: Jagruti Patni and Dr. Jigar Nagvadia (2026). BRIDGING THE CAPABILITY–ADOPTION GAP: A CONCEPTUAL FRAMEWORK FOR AI ADOPTION RESISTANCE AMONG MSMES IN GUJARAT, INDIA, International Journal of Research in Commerce and Management Studies (IJRCMS) 8 (5): 362-371 Article No. 881 Sub Id 1412

## BRIDGING THE CAPABILITY–ADOPTION GAP: A CONCEPTUAL FRAMEWORK FOR AI ADOPTION RESISTANCE AMONG MSMES IN GUJARAT, INDIA

Jagruti Patni<sup>1</sup> and Dr. Jigar Nagvadia<sup>2</sup>

<sup>1</sup>, <sup>2</sup>School of Management and Finance, Kaushalya – The Skill University (KSU), Ahmedabad, Gujarat, India  
Corresponding author: jagrutipatni70@gmail.com | Co-author: jnagvadia@gmail.com

DOI: <https://doi.org/10.38193/IJRCMS.2026.8523>

### ABSTRACT

Artificial Intelligence (AI) has emerged as a technology that can be applied in many areas, with the potential of revolutionizing the productivity, decision-making and competitiveness of Micro, Small and Medium Enterprises (MSMEs). However, the adoption of AI by MSMEs has been found to be less than by large enterprises across the globe and India and this is not just a technological, but an organizational and behavioral challenge. This paper proposes a conceptual framework — the Capability–Adoption Gap Model — based on the Technology–Organization–Environment (TOE) framework, Diffusion of Innovation (DOI) theory, and owner-manager behavioural-readiness constructs to understand the rationale behind the under-adoption of capable AI tools in the MSME ecosystem in Gujarat. The paper presents a narrative-synthesis of recent global, Indian and Gujarat-specific literature, and proposes four interacting sets of capabilities, namely technological, organizational, environmental/institutional and behavioural, that collectively influence adoption outcomes. Seven testable propositions are advanced that connect these dimensions to intention to adopt and actual use and implications for managerial and policy action for bridging the divide are presented. The framework provides researchers with a foundation for empirical testing and support agencies for MSMEs with a diagnosis tool to design interventions.

**KEYWORDS:** AI adoption, MSMEs, capability gap, TOE framework, digital transformation, Gujarat

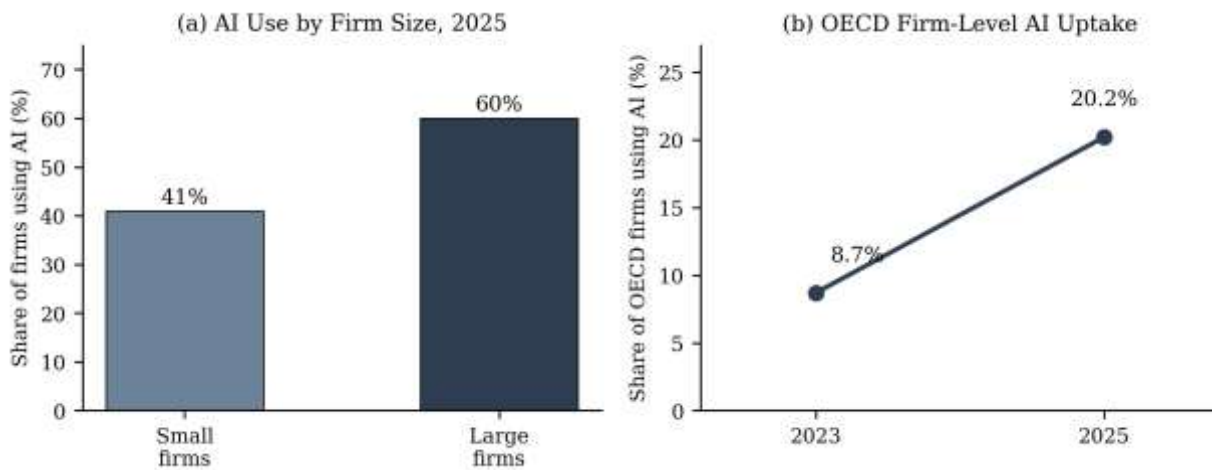
### 1. INTRODUCTION

AI has been deemed a general-purpose technology whose economic impact is projected to grow quickly, and is estimated to be over USD 1.7 trillion globally by 2032, from about USD 233 billion in 2024 [16]. While large enterprises have been the first and most prominent to benefit from this change, Micro, Small and Medium Enterprises (MSMEs) — that make up the bulk of jobs and firms in most economies, including India, are marginal adopters [2].

The size of the gap is well established. While the proportion of OECD companies implementing AI increased by more than two-fold between 2023 and 2025, from 8.7 percent to 20.2 percent, small firms still lag significantly behind large firms in terms of the proportion using AI (41 percent of small firms compared to more than 60 percent of large firms in 2025) [2] [18]. Government initiatives like the IndiaAI Mission with an outlay of over INR 10,300 crore have been specifically designed to scale compute, datasets, skilling and financing to MSMEs [10] in India. Despite this policy push, industry surveys have revealed that a large number of Indian MSMEs understand the potential of AI on paper but have not yet brought it to fruition; and, according to regional digital-maturity assessments, Gujarat lags behind its southern counterparts in terms of adoption, and is generally less advanced in the use of AI than other states, such as Karnataka and Maharashtra, across the manufacturing, agriculture and logistics sectors [11].

Much of the existing literature has approached this problem descriptively, cataloguing the barriers that MSMEs report — cost, lack of skilled personnel, inadequate infrastructure, low awareness of support schemes and data-related concerns chief among them [1], [4], [6]. What this body of work has done less well is explain a persistent paradox: many MSMEs that possess adequate technological and financial capability still delay or resist adoption, while some resource-constrained firms adopt readily. This suggests that capability and adoption are related but distinct constructs, and that the relationship between them is mediated by factors that existing barrier-inventories do not fully capture.

This paper addresses that gap conceptually. Drawing on the Technology–Organization–Environment (TOE) framework, Diffusion of Innovation (DOI) theory and behavioural-readiness constructs long used in individual-level technology-adoption research, the paper proposes a Capability–Adoption Gap Model that separates structural capability (technological, organizational and environmental/institutional) from owner-manager behavioural readiness, and positions the latter as a mediating condition for adoption. While the empirical focus of the author's ongoing doctoral research lies in a different domain of MSME and household behaviour under Protection Motivation Theory and Social Cognitive Theory, the present paper deliberately extends that same behavioural lens to a distinct substantive problem — AI adoption resistance — to test its portability as an explanatory device in the digital-transformation literature.



**Figure 1: Global AI adoption gap by firm size and OECD firm-level AI uptake, 2023–2025.**  
Sources: WTO–ICC World Trade Report 2025 [18]; OECD (2025) [2].

## 2. LITERATURE REVIEW AND THEORETICAL BACKGROUND

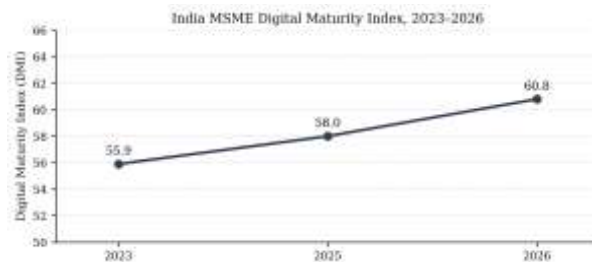
### 2.1 Global AI Adoption Landscape in SMEs

A systematic review of 71 studies on AI in industrial SMEs identified 27 distinct implementation challenges, with lack of knowledge, cost and low digital maturity emerging as the three most frequently cited barriers, spanning social, economic and technological categories respectively [1]. A parallel bibliometric and systematic review of AI adoption research in SMEs found that scholarly attention has grown sharply since 2020, clustering around three themes: AI-driven innovation, entrepreneurial decision-making and adoption barriers/enablers, while noting that methodological diversity and contextual variation across developing economies remain underexplored [3]. Qualitative fieldwork with SME representatives has similarly found that internal obstacles — reluctance to change, fear of job displacement and resource constraints — combine with external obstacles such as regulatory uncertainty and a fast-moving technology landscape to slow integration [4]. A recent survey-based study applying the TOE–DOI framework to SME AI adoption similarly concluded that structural readiness alone does not guarantee adoption, and called for a dual structural-and-perceptual lens on adoption dynamics [5].

### 2.2 AI Adoption among Indian and Gujarat MSMEs

India's roughly 63 million MSMEs contribute close to 30 percent of GDP and employ over 110 million people, making the sector central to any national AI strategy [10]. Reviews of Indian MSME AI adoption converge on a similar barrier set to the global literature — high implementation cost, workforce skill shortages, limited digital infrastructure, data-privacy concerns and low awareness of both AI tools and government support schemes [7]. A global AI playbook developed for India's

MSMEs estimates over USD 500 billion in unlocked economic value if adoption barriers are addressed [8], while sector analyses note that the affordability of most AI tools, and their limited support for India's linguistic diversity, particularly disadvantage MSMEs outside major metropolitan clusters [9].



**Figure 2: India MSME Digital Maturity Index, 2023–2026. Source: Vi Business MSME Growth Insights Study [11].**

At the state level, digital-maturity assessments place Gujarat among the top-performing states alongside Telangana, Karnataka and Maharashtra, yet within the state, digitalisation has historically progressed unevenly across MSME clusters, with earlier assessments noting that only a small minority of Gujarat MSMEs had adopted digital tools as of the late 2010s, constrained by limited technical skills, financial capacity and strategic vision [11]. This combination of strong aggregate positioning and persistent within-state unevenness makes Gujarat a useful setting in which to examine the capability–adoption relationship.

### 2.3 Theoretical Foundations

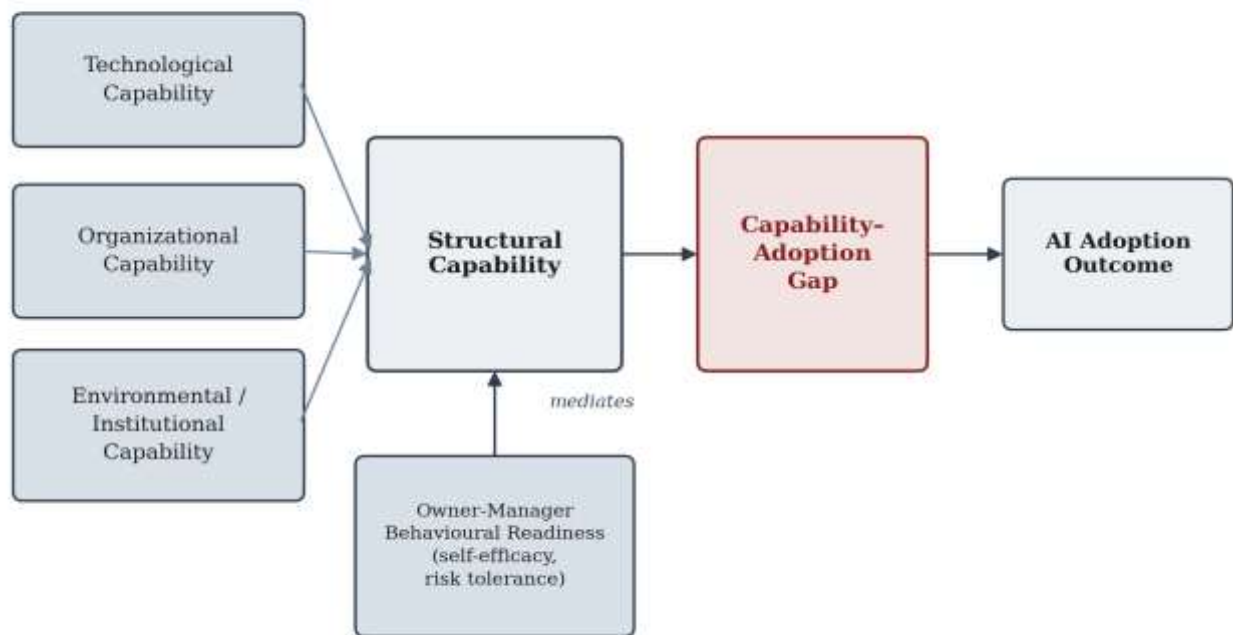
The TOE framework classifies the determinants of organizational technology adoption into technological factors (available tools, infrastructure, perceived attributes), organizational factors (firm size, resources, structure, managerial support) and environmental factors (industry structure, regulatory context, support institutions) [13]. DOI theory complements TOE by explaining why some innovations are adopted faster than others, attributing variation to an innovation's relative advantage, compatibility, complexity, trialability and observability from the adopter's perspective [12]. At the individual level, the Technology Acceptance Model links adoption behaviour to perceived usefulness and perceived ease of use [14], while Social Cognitive Theory foregrounds self-efficacy — an individual's belief in their own capacity to execute a behaviour — as a central determinant of whether intention translates into action [15]. Positioned together, TOE and DOI explain structural and perceptual readiness at the firm level, while self-efficacy-based behavioural constructs explain why owner-managers in structurally ready firms may still hesitate. It is this combination that motivates the Capability–Adoption Gap Model developed in Section 4.

### **3. METHODOLOGY**

This paper adopts a conceptual, narrative-review methodology consistent with established approaches to conceptual contribution in management research [17]. Rather than testing hypotheses on primary data, the objective is to synthesise a fragmented empirical literature into an integrative framework that can subsequently be operationalised and tested. Sources were identified through keyword searches ("AI adoption" AND "SME" OR "MSME") across Scopus-indexed outlets — including Management Review Quarterly, Applied Sciences, PLOS One and F1000Research — supplemented by institutional reports from the OECD, the World Trade Organization, the World Economic Forum and the Government of India, restricted to the period 2020–2026 to ensure currency given the pace of change in generative-AI accessibility. Sources were screened for direct relevance to SME/MSME-level AI adoption (as opposed to AI adoption in large enterprises or consumer contexts) and thematically coded against the TOE, DOI and behavioural-readiness constructs described in Section 2.3. The coded themes were then organised into the four-dimension framework presented in Section 4, and used to generate the research propositions presented in Section 5.

### **4. RESULTS: The Capability–Adoption Gap Conceptual Framework**

The central proposition of this paper is that MSME AI adoption is jointly determined by structural capability — spanning technological, organizational and environmental/institutional dimensions — and owner-manager behavioural readiness, and that the size of the observed "adoption gap" reflects the distance between capability and the behavioural threshold required for actual use. Table 1 summarises the four dimensions.



**Figure 3: The Capability–Adoption Gap Model: structural capability dimensions feed into a behaviourally-mediated adoption pathway.**

**Table 1: Dimensions of the Capability–Adoption Gap Model**

| Dimension                     | Sub-factors                                        | Manifestation of the Gap                                                     | Illustrative Evidence                                                                |
|-------------------------------|----------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Technological                 | Infrastructure, data quality, tool-fit             | Generic AI tools do not match MSME workflows, language or budget constraints | 27 implementation challenges identified across SME AI literature [1]                 |
| Organizational                | Lean teams, fragmented IT, ROI uncertainty         | Owners cannot estimate return on investment; systems remain siloed           | Cost and productivity evaluation rank among top adoption barriers [1]                |
| Environmental / Institutional | Scheme awareness, vendor ecosystem, policy support | Support schemes exist but remain unknown or mismatched to MSME needs         | Only a minority of eligible MSMEs are aware of digitalisation support programmes [2] |
| Behavioural (Owner-)          | Self-efficacy, risk tolerance,                     | Structurally capable firms still delay adoption due to                       | Reluctance to change and fear of job displacement                                    |

|          |                              |                                      |                                   |
|----------|------------------------------|--------------------------------------|-----------------------------------|
| Manager) | perceived relative advantage | low confidence or fear of disruption | reported as internal barriers [4] |
|----------|------------------------------|--------------------------------------|-----------------------------------|

#### 4.1 Technological Capability Gap

MSMEs frequently report that available AI solutions are built for large-enterprise data volumes, English-language interfaces and infrastructure that many smaller firms do not possess, producing a mismatch between what vendors offer and what MSMEs can absorb [9]. Data-related barriers — availability, quality and the absence of standardised collection practices — are among the most frequently cited technological obstacles in the SME AI literature [1].

#### 4.2 Organizational Capability Gap

Even where tools are technically accessible, MSMEs typically operate with lean teams, fragmented and non-interoperable software systems, and limited ability to estimate return on investment before committing resources, all of which slow internal decision-making around adoption [1], [9]. Cost concerns are consistently the second most-cited barrier after knowledge gaps, and are entangled with an inability to forecast returns [1].

#### 4.3 Environmental / Institutional Gap

Government schemes intended to lower adoption barriers often suffer from an awareness problem rather than a design problem: a large share of eligible small businesses remain unaware that digitalisation support programmes exist, and awareness alone does not guarantee that available support matches a firm's specific needs [2]. In the Indian context, the IndiaAI Mission's compute, dataset and skilling pillars represent a substantial institutional response, but translating national-level infrastructure into MSME-level uptake — particularly outside metropolitan clusters — remains an open institutional challenge [10].

#### 4.4 Behavioural (Owner-Manager) Readiness Gap

The fourth dimension is the least structurally visible but arguably the most decisive. Qualitative evidence points to reluctance to change and fear of job displacement as internal obstacles that persist independently of resource availability [4]. At the same time, large-scale surveys find that only a small minority of firms explicitly cite management or employee resistance as a barrier when asked directly [2], creating an apparent contradiction: resistance is behaviourally present but is rarely self-reported as a named obstacle. This is consistent with a self-efficacy-based reading of resistance — owner-managers may not experience their hesitation as "resistance" but as reasonable caution under uncertainty about their own capacity to manage a new technology, which is precisely the mechanism Social Cognitive Theory would predict [15].

## **5. DISCUSSION AND RESEARCH PROPOSITIONS**

The framework implies that capability-building interventions (technological upgrades, subsidised tools, infrastructure grants) will show diminishing returns unless they are paired with interventions that address owner-manager behavioural readiness. Seven propositions follow from this reasoning and are offered as a basis for future empirical testing:

P1: Technological capability is positively associated with AI adoption intention among MSMEs.

P2: Organizational capability is positively associated with adoption intention, and this association is stronger among MSMEs with formalised digital infrastructure.

P3: Environmental/institutional support — particularly awareness of relevant schemes and availability of MSME-tailored vendor solutions — moderates the relationship between technological capability and adoption.

P4: Owner-manager behavioural readiness (self-efficacy and risk tolerance) mediates the relationship between organizational capability and actual AI adoption.

P5: The capability–adoption gap is larger where perceived relative advantage of AI tools is low, even when objective technological capability is adequate.

P6: Sectoral and regional digital maturity moderates the strength of the capability–adoption relationship, such that manufacturing-heavy and less digitally mature MSME clusters exhibit a wider gap than service-sector or more digitally mature clusters.

P7: Awareness of government support schemes reduces the capability–adoption gap more than direct subsidy alone, holding technological capability constant.

## **6. THEORETICAL AND MANAGERIAL IMPLICATIONS**

Modeling TOE and DOI is theoretically extended by explicitly including an owner-manager behavioural mediator, which is not explicit in existing SME-AI models, and for which there is a call in existing literature for a combination of structural-and-perceptual perspective on adoption [5]. The framework recommends that managers prioritize small, high-pain-point AI applications, such as automating a specific repetitive task, and gradually expand usage over time rather than trying to fully transform their business with AI at once, aligning with the advice of practitioners to implement changes in a phased manner [9]. The framework suggests that enabling increased adoption of technology requires continuing investments in confidence building measures (demonstration projects, peer case studies, hands-on training) in addition to standard investments in capability building measures (subsidies, infrastructure, credit) for MSMEs, especially in Gujarat, where MSMEs are less digitally advanced and are concentrated in manufacturing areas.

## **7. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS**

As a conceptual paper, this framework has not yet been empirically validated; the propositions in Section 5 require operationalisation and testing through primary survey or mixed-methods research

among MSME owner-managers. The narrative synthesis draws primarily on published literature and institutional reports, which may over-represent firms that have already engaged with AI to some degree. Future research should develop validated measurement scales for the four capability dimensions and the behavioural-readiness construct, and test the proposed mediation and moderation relationships using primary data collected from MSME clusters across Gujarat, extending the rural–urban comparative lens already established in adjacent digital-behaviour research.

## **8. CONCLUSION**

This paper has argued that AI non-adoption among MSMEs is best understood not simply as a resource deficit but as a gap between structural capability and owner-manager behavioural readiness. By integrating TOE, DOI and self-efficacy-based behavioural constructs into a single Capability–Adoption Gap Model, the paper offers researchers a structured basis for future empirical work and offers MSME support agencies in Gujarat and beyond a diagnostic lens for designing interventions that address both the tools MSMEs lack and the confidence they need to use them.

## **REFERENCES**

- [1] L. Oldemeyer, A. Jede, and F. Teuteberg, "Investigation of artificial intelligence in SMEs: a systematic review of the state of the art and the main implementation challenges," *Management Review Quarterly*, vol. 75, no. 2, pp. 1185–1227, 2025.
- [2] OECD, "AI adoption by small and medium-sized enterprises: OECD discussion paper for the G7," OECD Publishing, Paris, 2025.
- [3] Y. Yesuf, Z. Fields, A. Jain, and E. Kassa, "Artificial Intelligence Adoption as a Driver of Innovation and Competitiveness in SMEs: A Bibliometric and Systematic Review," *F1000Research*, 2025.
- [4] R. Mohd Rasdi and N. Umar Baki, "Navigating the AI landscape in SMEs: Overcoming internal challenges and external obstacles for effective integration," *PLOS One*, vol. 20, no. 5, e0323249, 2025.
- [5] S. D. Prior et al., "Artificial Intelligence Adoption in SMEs: Survey Based on TOE–DOI Framework, Primary Methodology and Challenges," *Applied Sciences*, vol. 15, no. 12, p. 6465, 2025.
- [6] S. W. Mathagu, "Artificial intelligence in Small and Medium Enterprises – An Empirical Analysis of Critical Factors," *Premier Journal of Science*, vol. 1, p. 100009, 2024.
- [7] M. Dhanalakshmi, Jith, V. Sundhara Moorthy, M. Paulmurugan, Ramesh Kumar, and K. Kaur, "Adoption of AI in Indian MSMEs: Benefits, Challenges, and Future Prospects," *Advances in Consumer Research*, 2025.

- [8] World Economic Forum, "Transforming Small Businesses: An AI Playbook for India's MSMEs," WEF, Geneva, 2025.
- [9] Outlook Business, "How India's MSMEs Can Turn AI Potential into Performance," 2025. [Online magazine feature]
- [10] Government of India, Ministry of Micro, Small and Medium Enterprises, written reply on the IndiaAI Mission, Rajya Sabha, 2026.
- [11] Voice&Data, "AI adoption gains momentum among Indian MSMEs, Vi study finds," 2026.
- [12] E. M. Rogers, Diffusion of Innovations, 5th ed. New York: Free Press, 2003.
- [13] L. G. Tornatzky and M. Fleischer, The Processes of Technological Innovation. Lexington, MA: Lexington Books, 1990.
- [14] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," MIS Quarterly, vol. 13, no. 3, pp. 319–340, 1989.
- [15] A. Bandura, Social Foundations of Thought and Action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice-Hall, 1986.
- [16] O. Agbaakin, "Leveraging Artificial Intelligence as a Strategic Growth Catalyst for Small and Medium-sized Enterprises," arXiv:2509.14532, 2025.
- [17] D. J. MacInnis, "A framework for conceptual contributions in marketing," Journal of Marketing, vol. 75, no. 4, pp. 136–154, 2011.
- [18] World Trade Organization and International Chamber of Commerce, "World Trade Report 2025: Making Trade and AI Work Together to the Benefit of All," WTO, Geneva, 2025.

**Author Profile**

Jagruti Patni is a PhD Scholar at Kaushalya – The Skill University (KSU), School of Management and Finance, Ahmedabad, Gujarat, India, working under the supervision of Dr. Jigar Nagvadia. Her doctoral research examines digital-payment fraud vulnerability and preventive awareness in the context of financial inclusion using a rural–urban comparative design grounded in Protection Motivation Theory and Social Cognitive Theory. She also teaches Business Mathematics and Business Ethics to undergraduate students at KSU.