

# Optimizing AI Chatbot Adoption for MSME Competitiveness

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## ABSTRACT

**Purpose:** This study reviews empirical evidence on AI chatbots in micro and small MSMEs to explain their impact on sales performance and customer satisfaction and to identify key drivers, barriers, and adoption strategies relevant to Society 5.0.

**Methodology:** A PRISMA-guided systematic literature review was conducted across Scopus-indexed sources (ScienceDirect, Emerald, MDPI), covering July 2014–July 2025. Thirty-nine articles met the inclusion criteria.

**Findings:** Flow and Technology Interactivity explain how readability, transparency, personalization, responsiveness, and ubiquitous connectivity create flow, thereby enhancing communication quality and satisfaction. TAM/UTAUT and meta-UTAUT show perceived usefulness as the most consistent driver of intention and continuance, with perceived intelligence and anthropomorphism reinforcing acceptance; privacy risk, time risk, technological anxiety, and data/security concerns inhibit adoption. The TOE lens groups context-specific enablers and constraints across technology, organization, and environment, while RBV and Dynamic Capabilities clarify how AI-CRM, data governance, multichannel integration, and sensing–seizing–reconfiguring convert conversational value into advantage.

**Keywords:** *Systematic Literature Review; AI Chatbot; SME's; TAM-UTAUT; TOE*

## INTRODUCTION

Customer service in many sectors is shifting to digital channels as firms adopt AI across business processes and customer relationship management, thereby normalizing AI in service organizations and spurring AI-driven CRM to automate routine tasks and personalize interactions (Yoo et al., 2024). In parallel, shifts in information and

communication technologies reshape consumer behaviour, creating expectations for access and availability; chatbots have therefore become a prominent online touchpoint because they can deliver real-time information and assistance (Kwangsawad & Jattamart, 2022).

As adoption grows, chatbots increasingly assume tasks previously performed by human agents at customer contact points. Empirical evidence indicates that intelligent conversational interfaces enable direct interaction with providers and improve service quality and speed; in many settings, they are reported to substitute traditional service methods, reflecting a broader shift from human-driven to technology-mediated interactions in small and medium business contexts (Baabdullah et al., 2022).

These benefits are contingent on user experience design. A Flow Theory and Technology Interactivity model, tested among courier service users, shows that readability, transparency, personalization, responsiveness, and ubiquitous connectivity jointly shape flow, which elevates communication quality and satisfaction (Baabdullah et al., 2022). In MSME contexts, combining rapid responses, simple interaction steps, human-like conversation, and personalized recommendations increases enjoyment and perceived usefulness, thereby promoting intentions to use and to shop (Selamat & Windasari, 2021).

Notwithstanding these gains, the literature documents unresolved gaps in the formation of virtual experience and in effective conversational design. Prior studies validate several drivers yet highlight inhibitors that remain insufficiently addressed, including the need for human interaction (Wei & Pardo, 2022), perceived risks that dampen value and intent (Kwangsawad & Jattamart, 2022; Maroufkhani et al., 2022; Polas et al., 2022), technological anxiety, and privacy and security concerns that affect acceptance and sustained use (Darban et al., 2024; Kwangsawad & Jattamart, 2022; Wasudawan et al., 2025). Evidence on MSMEs remains limited, underscoring the need to map features and strategies calibrated to the characteristics of micro and small enterprises and their customers.

To account for intention and adoption, TAM and UTAUT, including meta-UTAUT, incorporate system factors such as perceived intelligence and anthropomorphism alongside user factors. Empirical evidence indicates that these system factors more strongly explain attitudes and continuance than traditional UTAUT constructs, with social self-efficacy and demographic differences as moderators (Balakrishnan et al., 2022).

In the MSME context, the TOE framework organizes drivers and barriers across technology, organization, and environment. Infrastructure readiness, digital competence, managerial support, external pressures, cost, and regulation can accelerate or hinder the use of AI in services, particularly when crisis conditions lead to

uneven digitalization among MSMEs (Muhammad et al., 2025).

For strategy and competitiveness, RBV treats data, algorithms, and analytics capabilities as strategic resources, while Dynamic Capabilities emphasizes sensing, seizing, and reconfiguring to absorb and grow AI value over time. In MSMEs, strengthening dynamic capabilities is associated with resilience and competitive advantage when coupled with strategic foresight; recent work integrating TOE and RBV indicates that AI adoption mediates TOE effects on MSME performance, implying that outcomes depend not only on technology per se but also on result-oriented organizational capabilities (Haq, Suki, Zaigham, et al., 2025; Saeedikiya et al., 2024).

Accordingly, this article offers a PRISMA-guided systematic review of empirical studies on AI chatbots in micro and small MSMEs to examine how they shape sales performance and customer satisfaction and to clarify the technological, organisational, and strategic conditions that enable effective adoption in the Society 5.0 context.

## **METHODS**

The research method was a systematic literature review conducted in accordance with the PRISMA 2020 guidelines to ensure that the processes of identifying, screening, assessing eligibility, and synthesizing articles were systematic, transparent, and replicable.

### **Formulation of Research Questions**

RQ1: What are the findings in the literature regarding the impact of AI chatbot implementation on sales performance and customer satisfaction in MSMEs (especially micro and small ones) in the context of Society 5.0?

RQ2: Which factors drive and barriers the adoption of AI chatbots in micro and small MSMEs, according to previous studies?

RQ3: What evidence-based strategies are proposed in the literature to optimise the adoption of AI chatbots to enhance the competitiveness of MSMEs?

### **Literature Search Strategies**

The literature search strategy in this study focused on two central databases indexed by Scopus, namely ScienceDirect, Emerald, and MDPI, to ensure the coverage of credible and reputable sources. The keywords using Boolean in the search process consist of: ‘AI chatbot AND (SME or SMEs) AND technology adoption AND (challenges OR success factors) AND (customer experience OR customer satisfaction) AND (sales performance OR business performance)’. These keywords were designed to capture articles relevant to AI chatbots in SMEs within the Society 5.0 framework, covering

technology adoption, drivers and barriers, customer experience and satisfaction, and sales and business performance. The publication-year range was set from July 2014 to July 2025 to ensure that the analysis reflects the dynamics of the last decade while capturing the latest developments. With this strategy, the selected articles are expected to represent the latest developments in practice and academic studies on the implementation of AI chatbots in MSMEs.

To clarify the selection process, the following are the inclusion and exclusion criteria used in this study:

**Table 1. Inclusion & Exclusion Criteria**

Inclusion	Exclusion
AI chatbots for MSMEs, AI chatbots for sales performance, AI chatbots for customer satisfaction, AI chatbots in the Society 5.0 era.	Topics outside of these areas
Scopus-indexed journal articles (Emerald, ScienceDirect, and MDPI)	Articles from non-Scopus databases
Peer-reviewed scientific article	Non-journal articles, non-peer-reviewed articles, editorials, popular reviews, opinions, books, book chapters
July 2014 – July 2025	Publication outside of this time period
English	Non-English

Source: Author’s own work, 2025

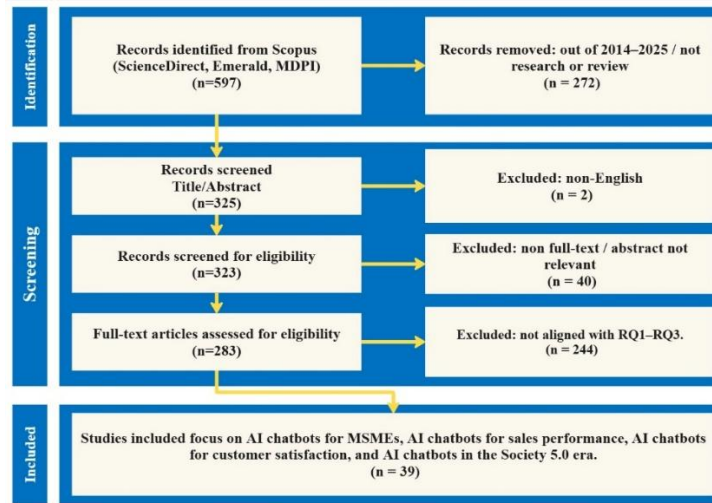
### Article Selection Process

The selection process followed the PRISMA framework. At the identification stage, a search of three Scopus-indexed journals, namely ScienceDirect, Emerald, and MDPI, yielded 597 articles. In the initial screening, 272 articles were excluded because they were published outside the 2014-2025 period or were not research or review articles, leaving 325 for further review. The next stage screened the manuscripts' language, excluding two non-English articles.

The next screening assessed the availability of complete manuscripts and the relevance of the topics in the abstracts. At this stage, 188 articles were excluded because the full text was unavailable or the abstract was irrelevant, leaving 283 articles for the eligibility assessment stage. In the full-text eligibility assessment, 244 articles were eliminated because they were not substantially aligned with research questions RQ1 to RQ3.

Thirty-nine articles met all inclusion criteria and were analysed. The selected articles focused on AI chatbots for MSMEs, on AI chatbots related to sales performance and customer satisfaction, and on studies

of AI chatbots within the Society 5.0 framework. This flow ensured that the SLR process was systematic, transparent, and traceable, in line with the research quality and accountability objectives described in Figure 1.



Source: Author’s own work, 2025

**Figure 1. PRISMA Workflow of the AI Chatbot AI Selection Articles Process**

### Analysis

The analysis examined the impact, drivers, barriers, and strategies for adopting AI chatbots in MSMEs. The results of the analysis were mapped to relevant theoretical lenses, namely Flow and Technology Interactivity to explain communication quality and satisfaction, TAM or UTAUT and its variants to explain intention and adoption, TOE to group technological, organisational, and environmental factors in the context of SMEs, and RBV and Dynamic Capabilities to link organisational strategies and capabilities with competitiveness.

## RESULTS

### Article Inclusion

All selected articles from the selection process are then detailed in Table 2.

**Table 2. Articles Included**

Code	Authors	Journal Name	Publisher	Findings
A1	Nicolescu & Tudorache (2022)	Electronics	MDPI	Factors related to the chatbot, the customer, and the context primarily determine response relevance and problem resolution, which in

				turn drive satisfaction, purchase or recommendation intention, and continued use.
A2	Meng et al. (2025).	Behavioural Sciences	MDPI	Proactive rather than reactive responses increase purchase intention, mediated by psychological distance and performance expectancy, with emojis moderating the effect on psychological distance but not on performance expectancy.
A3	Polas et al. (2022).	Journal of Open Innovation: Technology, Market, and Complexity	MDPI	AI knowledge, perceived relative advantage, and perceived ease of use positively drive blockchain adoption, while risk-taking only mediates the path from knowledge to adoption.
A4	Guercini (2023)	Management Decision	Emerald	Marketers still rely heavily on heuristics; automation alters the scope of their use.
A5	Appio et al. (2024).	European Journal of Innovation Management	Emerald	A digital transformation roadmap for SMEs progresses through scanning, testing, adoption, integration, alignment, and permanent transformation stages, and is driven by three key paradoxes that influence its trajectory.
A6	Wasudawan et al. (2025).	Journal of Asia Business Studies	Emerald	Perceived ease of use, perceived usefulness, and perceived trust positively shape attitude, which in turn increases intention to use. No gender differences were found, and stronger privacy and security policies, along with

				higher information quality, bolster SME trust.
A7	Jobstreibizer et al. (2025).	Management Decision	Emerald	AI is transforming business models by emphasizing narrow applications, circular business models, and generative AI, and proposes an AI integration roadmap to gain a competitive advantage.
A8	Abrokwah-Larbi (2024)	African Journal of Economic and Management Studies	Emerald	A strong customer focus drives significant improvements in financial, customer, internal process, and learning and growth performance, with AIM included as a supporting pillar.
A9	Haq, Suki, Setini, et al. (2025)	Sustainable Futures	Elsevier	Perceived ease of use, perceived usefulness, and organizational readiness increase Green AI adoption, which in turn improves environmental and operational performance; green innovation mediates this link, and green strategic leadership moderates it, while funding and readiness remain key challenges.
A10	Matekaire & Siriram (2025)	Journal of Open Innovation: Technology, Market, and Complexity	Elsevier	Driving factors: PU, PEOU, relative advantage, compatibility, security; barriers: technical complexity, infrastructure (connectivity/electricity), cost, payment risks/crime; requires regulatory support & technological readiness.

A11	Ayinaddis (2025)	Journal of Innovation & Knowledge	Elsevier	AI enablers/barriers in SMEs: lower infrastructure and financial readiness, limited competencies; management support, vendor/ecosystem partnerships, and regulatory compliance are important; SMEs dominate the focus of the study ( $\pm 44\%$ ).
A12	Darban et al. (2024).	Procedia Computer Science	Elsevier	52.5% of respondents are very/extremely familiar with AI; 51.62% willingness 4–5/5; willingness & familiarity differ significantly according to age ( $p < 0.001$ ).
A13	Shore et al. (2024)	Technovation	Elsevier	GenAI & EO have a significant impact on the formation of ER (dynamic capabilities).
A14	Kavak & Rusu (2025)	Procedia Computer Science	Elsevier	Key challenges: bias, data privacy, transparency/explainability; also, data governance, top management support, and costs.
A15	Leocádio et al. (2024)	Procedia Computer Science	Elsevier	Benefits of AI-powered HRC: reduced costs, increased productivity and decision-making, improved CX; chatbots and virtual assistants help manage customer emotions; challenges: job displacement, bias.
A16	Muhammad et al. (2025).	Technological Forecasting & Social Change	Elsevier	Technological, organizational, and environmental factors shape digital transformation outcomes, leading some SMEs to accelerate while others lag, necessitating

				inclusive policies and capacity building to close the digital divide.
A17	Ingaldi & Klimecka-Tatar (2022)	Procedia Computer Science	Elsevier	Digitalisation and e-commerce drive service quality and personalisation; SME barriers include funding, bureaucracy, and competence; human capital/soft skills are crucial; chatbots are listed as a service process technology option.
A18	Salah & Ayyash (2024)	Journal of Open Innovation: Technology, Market, and Complexity	Elsevier	AI integration, customer tech-savviness, an innovation culture, competitive pressure, and partner pressure collectively drive increased e-commerce adoption.
A19	Jatmika et al. (2024)	Procedia Computer Science	Elsevier	Proposing AI marketing frameworks and prototypes; emphasising chatbots for retention and conversion, training modules and digital tutorials; bridging the digital transformation of micro-enterprises.
A20	Haq, Suki, Zaigham, et al. (2025)	Journal of Digital Economy	Elsevier (INPRESS)	AI adoption mediates the effects of organizational and environmental factors on SME performance; AI-driven marketing strengthens this link, whereas skill gaps and limited funding and infrastructure remain challenges.
A21	Aljarboa (2024)	International Journal of Information Management Data Insights	Elsevier	Dynamic capabilities and entrepreneurial orientation increase AI adoption in e-commerce, thereby enhancing SME performance.

A22	Bahaw et al. (2025).	Sustainable Futures	Elsevier	Perceived ease of use and perceived usefulness increase intention and lead to actual use of generative AI, whose main applications are operational efficiency, data-driven decision-making, sustainable product and service innovation, and sustainable brand identity, yielding triple-bottom-line benefits.
A23	Choudrie et al. (2023).	Technological Forecasting & Social Change	Elsevier	Mobile AI functions (including chatbots/assistants) are valuable for daily tasks and interactions; barriers include device cost, privacy/data ownership, digital literacy, the need for training, and policy-maker support.
A24	Al-Kfairy (2025)	Telematics and Informatics Reports	Elsevier	Customer demand is the strongest driver, followed by perceived benefits and technical infrastructure; cost hinders adoption, and competitive pressure is a weaker influence.
A25	Kwangsawad & Jattamart (2022)	Journal of Innovation & Knowledge	Elsevier	Privacy risk and time risk reduce attitudes and intentions to adopt; tech anxiety acts as an obstacle; information quality indirectly increases intentions; and openness to experience has no effect.
A26	Saeedikiya et al. (2024).	Journal of Cleaner Production	Elsevier	DC sensing–seizing–reconfiguring is necessary for DT; DT, as a new capability and source of improved performance, requires management support, digitally mature

				human resources, and structural redesign.
A27	Enshassi et al. (2025).	Journal of Open Innovation: Technology, Market, and Complexity	Elsevier	Dynamic capabilities of sensing, seizing, and reconfiguring are necessary for digital transformation, which builds new capabilities and improves performance but requires management support, digitally mature human resources, and structural redesign (no magic shortcuts).
A28	Wei & Pardo (2022)	Industrial Marketing Management	Elsevier	Identify the three layers of AI platform architecture; six user roles (users, designers, ideators, intermediaries, innovators, module providers) and interaction mechanisms; conditional factors: knowledge (operational, functional, technological).
A29	Ruiz et al. (2025)	Procedia Computer Science	Elsevier	Key trends like e-commerce, chatbots, big data, and AR for personalization, together with innovations such as voice recognition and real-time adaptive algorithms, are optimizing consumer interactions and marketing strategies.
A30	Carayannis et al. (2025).	Technology in Society	Elsevier	The AI-foresight framework helps anticipate disruptions, operational efficiency, and data-driven decision-making; highlights financial, technical, and regulatory barriers; and provides a step-by-step adoption pathway for low-tech MSMEs.

A31	Rajaram & Tinguely (2024)	Business Horizons	Elsevier	GenAI can streamline processes, drive innovation, and increase competitiveness; it offers strategic dimensions for implementation and practical recommendations for MSMEs.
A32	Maroufkhan i et al. (2022).	Technological Forecasting & Social Change	Elsevier	Privacy risk is the most significant barrier to perceived value; brand credibility reduces this adverse effect, and brand loyalty is positively associated with perceived value.
A33	Shankar (2025)	Marketing Strategy Journal	Elsevier	AI-driven market intelligence leads to more effective strategies; AI-based personalization increases adoption and satisfaction; and community engagement, together with word-of-mouth, accelerates adoption.
A34	Cancela-Outeda (2024)	Internet of Things	Elsevier	Establishing a collaborative governance system (European AI Office, Board, forum, scientific panel); a risk-based approach to balance innovation and fundamental rights; legal certainty for investment.
A35	Yoo et al. (2024).	Heliyon	Elsevier	The four characteristics of AI-CRM affect CRM capabilities differently, thereby increasing performance and competitive advantage. Practical implications: focus on critical features per function (marketing/sales/service).

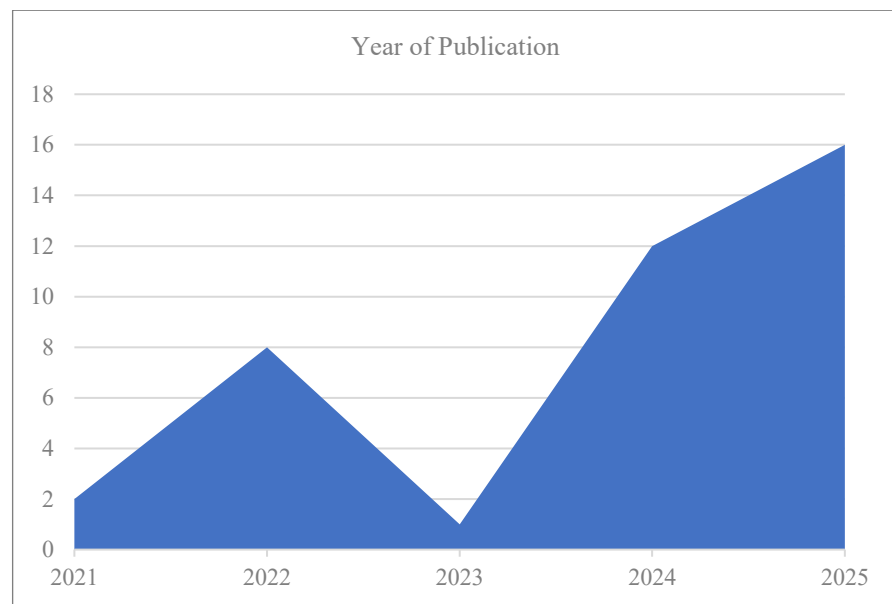
A36	Balakrishnan et al. (2022).	Technological Forecasting & Social Change	Elsevier	System factors (intelligence & anthropomorphism) have a more substantial influence on attitudes and continuance intentions than meta-UTAUT factors; social self-efficacy negatively moderates the relationship between system factors and continuance; implication: add elements.
A37	Alnofeli et al. (2025).	Journal of Innovation & Knowledge	Elsevier	Three main dimensions and eight sub-dimensions: Data management (governance, analytics, privacy/security), Multichannel integration (content and process consistency), Service offering (personalisation, automation, meaning/uniqueness).
A38	Baabdullah et al. (2022).	Technological Forecasting & Social Change	Elsevier	Readability, transparency, personalization, responsiveness, and ubiquitous connectivity enhance flow, and that improved flow raises communication quality and customer satisfaction.
A39	Selamat & Windasari (2021)	Technology in Society	Elsevier	MSMEs should integrate four features—fast, responsive service, simple action triggers, human-like conversations, and personalized recommendations—to maximize impact.

Source: Author's own work, 2025

Of the 39 included articles, the majority were published in the Elsevier database, with the remainder appearing in MDPI and Emerald. The

findings ranged from direct customer outcomes such as purchase intention and satisfaction, to organisational enablers such as AI-CRM, data governance, and multichannel integration, as well as adoption drivers and barriers in the context of micro-small MSMEs, such as usefulness, ease of use, readiness, cost, privacy, and technology anxiety. Overall, this table presents a reasonably comprehensive overview of evidence on the impact on customers, the drivers and barriers to adoption, and implementation strategies that strengthen MSMEs' competitiveness.

### Publication per Year

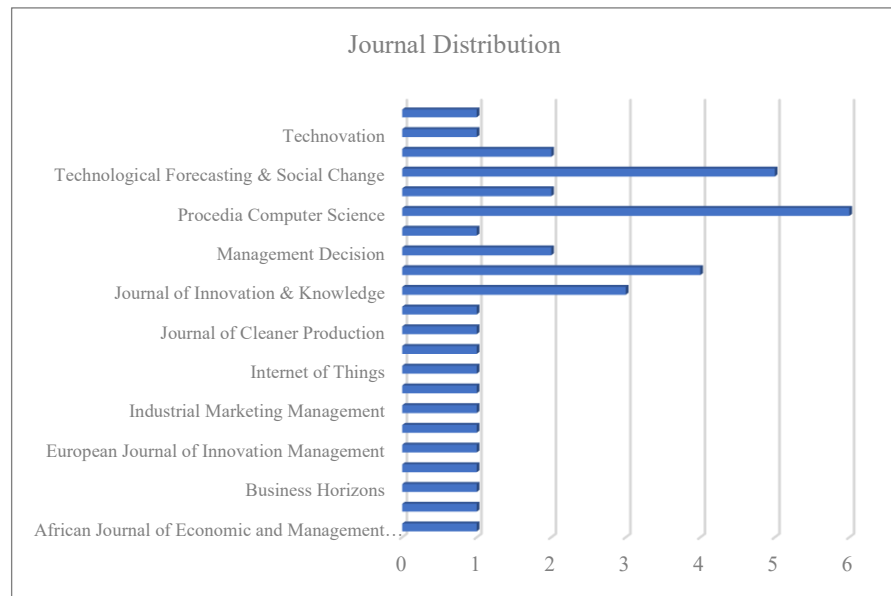


Source: Author's own work, 2025

**Figure 2. Publication per year (n=39)**

The sharp decline in 2023 is more accurately understood as a bibliometric artefact arising from the asynchrony between the online-first and published-in-issue phases of the publishing cycle. Many manuscripts completed at the end of 2023 appeared online first but were not assigned volume and issue numbers until 2024; thus, they were classified as 2024 outputs in the annual recapitulation rather than 2023 outputs (see Figure 2). In addition, the inclusion framework, which focused specifically on AI chatbots for MSMEs, excluded 2023 articles that retained a general AI theme, thereby making the proportion of 2023 publications appear smaller than it actually was. We also note the impact of the surge in generative AI research in late 2022, which extended the peer review, production, and indexing cycles, leading to a shift in publication output to 2024 and 2025. Thus, the 'valley' in 2023 does not reflect a stagnation in research but rather the methodological consequences of publication dates, inclusion criteria, and the intertwined dynamics of the editorial process.

## Journal Distribution



Source: Author's own work, 2025

**Figure 3. Distribution of articles per journal (n = 39)**

The distribution of journals (see Figure 3), which are included, shows the highest concentration in *Procedia Computer Science* with six articles, followed by *Technological Forecasting & Social Change* with five articles, *Journal of Open Innovation: Technology, Market, and Complexity* with four articles, and *Journal of Innovation & Knowledge* with three articles. The middle group comprises three journals, each with two articles: *Management Decision*, *Sustainable Futures*, and *Technology in Society*. The rest are spread across 15 journals, each contributing only 1 article. This pattern indicates a relatively broad evidence base across domains, with strong clusters among outlets oriented toward technological transformation and innovation.

## DISCUSSION

**RQ1: What are the findings in the literature regarding the impact of AI chatbot implementation on sales performance and customer satisfaction in MSMEs (especially micro and small ones) in the context of Society 5.0?**

Evidence from the corpus shows that the impact of AI chatbots on the sales performance and customer satisfaction of micro and small MSMEs is strongest when customer outcomes are reported directly, for example, systematic mapping linking chatbot factors, customer characteristics, and service context to satisfaction, purchase intent, and recommendations through fast and relevant problem resolution (Nicolescu & Tudorache, 2022). Experimental findings show that proactive response strategies and appropriate use of emojis increase

purchase intention by fostering psychological closeness and higher performance expectations (Meng et al., 2025). In the context of voice assistants, brand credibility mitigates the adverse effects of privacy risks, thereby strengthening loyalty and continued use associated with relational satisfaction (Maroufkhani et al., 2022). At the marketing strategy level, AI-based personalisation is proposed to increase adoption and satisfaction, thereby influencing market acceptance of high-tech products (Shankar, 2025). At the service organisation level, AI features in marketing, sales, and service strengthen CRM capabilities associated with performance and competitive advantage, including implications for loyalty and satisfaction (Yoo et al., 2024). Empirical evidence on service chatbots also shows that readability, transparency, personalisation, responsiveness, and connectivity converge into a flow experience that enhances communication quality and satisfaction (Baabdullah et al., 2022). A review of digital transformation notes that the opportunities for AI in customer engagement and loyalty will be more apparent when data governance and ethics are properly managed (Kavak & Rusu, 2025).

Beyond direct measures, some studies place proxies close to satisfaction and revenue, such as experience flow, communication quality, repurchase intention, and continuance triggered by personalisation and AI market intelligence, so that they remain relevant for reading the path of impact towards satisfaction and purchase even though they do not explicitly report sales figures (Balakrishnan et al., 2022). On the organisational side, the value of chatbot conversations tends to be monetised if the capability foundation is well prepared. This includes entrepreneurial orientation (Shore et al., 2024), the orchestration of human and robot tasks that improve efficiency and service quality (Muhammad et al., 2025), digital readiness of service processes to ensure smooth and consistent chatbot channels (Salah & Ayyash, 2024), AI integration in e-commerce related to marketing performance (Haq, Suki, Zaigham, et al., 2025), and foresight-based planning for MSME resilience (Shore et al., 2024). Customer-side barriers, such as privacy risks, time constraints, and technology anxiety, must be managed to achieve satisfaction (Saedikiya et al., 2024). Mapping AI-CRM capabilities in data, analytics, multichannel integration, and personalised service offerings acts as a lever that channels conversational experiences into satisfaction and performance indicators (Alnofeli et al., 2025). At the same time, competencies, an innovative culture, and process integration in MSMEs determine whether AI channels, including chatbots, effectively drive customer outcomes and performance in micro and small contexts (Abrokwah-Larbi, 2024; Haq, Suki, Setini, et al., 2025).

Several other articles are relevant to addressing RQ1, even though the findings do not explicitly mention satisfaction or sales, as they still

provide a causal context that reinforces the impact pathway. These include an overview of the factors influencing the adoption of IoT-based payment systems and their implications for customer performance through usability, convenience, cost, and risk (Matekaire & Siriram, 2025), the dynamics of AI adoption across firm sizes highlighting organisational enablers and barriers (Ayinaddis, 2025), consumer readiness for AI assistance and CRM as prerequisites for satisfaction (Darban et al., 2024), opportunities and challenges of AI in digital transformation that emphasise the importance of governance and integration (Leocádio et al., 2024), the digital divide among MSMEs during crises that explains variations in benefit realisation (Kawane et al., 2024), an AI-based marketing framework for micro entrepreneurs mapping the path to conversion (Jatmika et al., 2024), factors influencing AI adoption in MSME e-commerce contributing to performance upon successful adoption (Bahaw et al., 2025), leveraging AI features on smartphones for more responsive services (Choudrie et al., 2023), the adoption of retail VR that is relevant when integrated into an AI-assisted service ecosystem (Kwangsawad & Jattamart, 2022), a map of generative AI adoption that highlights the benefits and risks for customer value (Enshassi et al., 2025), AI adoption drivers and barriers in MSMEs (Wei & Pardo, 2022), B2B AI platform integration contributing to customer value when operationalised (Ruiz et al., 2025), the role of AI in digital marketing sustainability and customer value (Carayannis et al., 2025), the relationship between customer focus and MSME performance (Rajaram & Tinguely, 2024), a map of digital transformation in the mobility sector based on dynamic capabilities (Maroufkhani et al., 2022), and evidence of a chatbot prototype for MSMEs that shows an increase in intention to shop and intention to use through humanised, fast, simple, and personal conversations (Selamat & Windasari, 2021).

Overall, the corpus supports the conclusion that, within the Society 5.0 framework, which emphasises real-time and human-centred services, AI chatbots have a positive impact on satisfaction and purchasing behaviour in micro and small MSMEs when the quality of conversation is high and organisational capabilities are in place to translate these into performance metrics.

### **RQ2: Which factors are drivers and barriers to the adoption of AI chatbots in micro and small MSMEs according to previous studies?**

Cross-study findings indicate that the adoption of AI chatbots in micro and small MSMEs is primarily driven by the user experience dimension, which offers tangible benefits to customers. Perceived usefulness consistently emerges as the strongest driver, whereas perceived ease of use exerts a weaker influence, underscoring the

importance of designing and communicating business value (Enshassi et al., 2025). System factors such as perceived intelligence and anthropomorphism reinforce attitudes and continuance because they make conversations feel more competent and friendly (Balakrishnan et al., 2022). Brand credibility helps reduce perceived privacy risk associated with voice assistants, thereby encouraging loyalty and continued use, signaling acceptance of more innovative conversational interfaces (Maroufkhani et al., 2022). At the micro-interaction level, the same design cues identified above trigger flow that improves customer evaluation of channel utility, while humanised, fast, and simple conversation design increases enjoyment and usefulness, leading to intent to use and intent to purchase on SME channels (Baabdullah et al., 2022; Selamat & Windasari, 2021). Proactive messaging tactics and appropriate use of emojis reduce psychological distance and raise performance expectations, thereby strengthening adoption intent at the moment of decision (Meng et al., 2025). Consumer readiness for AI assistance and CRM is an important prerequisite, as initial perceptions of usefulness, ease of use, and trust guide initial acceptance of chatbots in small services (Darban et al., 2024). Service–chatbot confirms the grouping of factors that drive acceptance: chatbot factors, customer factors, and situational service factors, which together facilitate rapid and relevant problem resolution and a valuable experience (Nicolescu & Tudorache, 2022). In a sustainable context, the usability and usefulness of GenAI correlate with triple-bottom-line benefits and the strengthening of an environmentally friendly brand identity, thereby providing normative reasons for adopting conversational AI in MSMEs (Bahaw et al., 2025).

On the organisational side, adoption persists when the foundations of capability and governance are in place. AI-CRM capabilities in data governance and analytics, multichannel integration, and personalised service offerings act as levers that translate chatbot interactions into value for customers and operations; conversely, organisational resistance, integration complexity, and privacy concerns slow adoption if not managed (Alnofeli et al., 2025). Mixed evidence indicates that AI features in marketing, sales, and service strengthen CRM capabilities, which in turn are linked to performance and competitive advantage, thereby making frontline team empowerment and process orchestration part of the adoption agenda (Yoo et al., 2024). Other recurring drivers for MSMEs are top management support, employee digital skills, access to funding, and data privacy compliance; therefore, training programmes, implementation mentoring, and risk management are components of internal policies that need to be designed from the outset (Aljarboa, 2024; Haq, Suki, Zaigham, et al., 2025). The dynamic capability perspective posits that sensing opportunities, seizing solutions, and reconfiguring processes are mechanisms that enable MSMEs to absorb conversational

technology and adapt their structures to realize benefits (Saeedikiya et al., 2024). The adoption of integrated e-commerce facilitates the use of chatbots as a service interface, as digital process readiness correlates positively with marketing performance (Salah & Ayyash, 2024). In platform architecture, three layers of AI integration, data culture, reskilling, and sunk-cost management determine the smoothness of trials in scaling (Wei & Pardo, 2022). A regulatory environment that provides certainty and risk guidelines, such as the European collaborative governance framework, drives the ecosystem by reducing compliance uncertainty while protecting customers' fundamental rights (Carayannis et al., 2025). The dynamics of adoption knowledge also highlight the need for cross-industry system integration and regulatory compliance, while case studies on the use of smartphone AI in MSMEs emphasise digital literacy, training, and policy support as prerequisites for readiness (Ayinaddis, 2025; Choudrie et al., 2023).

The most consistent barriers to adoption at the customer level are privacy risk, time risk, and technological anxiety, which reduce attitudes and intentions, especially when conversations feel rigid or non-transparent; mitigation strategies include information clarity, user control, and human handover routes for complex cases (Kwangsawad & Jattamart, 2022). At the organisational level, issues of bias and data quality, decision transparency, and security emerge as sources of internal and external resistance, requiring governance, auditing, and ethical practices to maintain trust (Kavak & Rusu, 2025; Leocádio et al., 2024). Integration costs, data talent needs, and technical complexity pose implementation barriers, particularly for MSMEs with limited resources (Shankar, 2025). The digital divide during the crisis emphasised that unequal infrastructure, funding, and capabilities can widen the adoption gap, making inclusive policy support and capability-building interventions essential (Muhammad et al., 2025).

In summary, AI chatbot adoption among MSMEs increases when perceived benefits are clear at the interface level, when organisational foundations and governance mitigate risk, and when the regulatory ecosystem and policy support reduce uncertainty and transition costs; conversely, perceived risk, integration complexity, talent shortages, and resource constraints slow or prevent adoption.

### **RQ3: What evidence-based strategies are proposed in the literature to optimise the adoption of AI chatbots to enhance the competitiveness of MSMEs?**

Evidence-based strategies for optimising AI chatbot adoption in MSMEs converge on three layers. At the conversational layer, design choices should translate the micro-level drivers identified in RQ1–

RQ2 into journeys that solve customer problems quickly, feel human, and guide customers towards purchase. Studies in MSME and small-business contexts show that the configuration of flow-inducing design cues – such as clarity of messages, appropriate transparency about system limits, responsiveness, and light anthropomorphic touches – fosters enjoyment and perceived usefulness, which in turn increase intention to use and intention to shop on messaging channels (Baabdullah et al., 2022; Balakrishnan et al., 2022; Selamat & Windasari, 2021). Operational tactics, such as proactive messages and carefully timed emoji use, can reduce psychological distance and increase performance expectations at the moment of decision, provided that they do not create unrealistic promises (Maroufkhani et al., 2022; Meng et al., 2025). Consumer readiness for AI assistance and CRM remains a prerequisite, as initial perceptions of usefulness, ease of use, and trust shape early acceptance of chatbots in small service settings (Bahaw et al., 2025; Darban et al., 2024; Nicolescu & Tudorache, 2022).

At the organisational layer, the central strategy is to convert conversational interactions into measurable value through AI-CRM levers. The literature consistently highlights three pillars – data governance and analytics, multichannel integration, and personalised service offerings – as mechanisms that channel conversational experiences into satisfaction and business performance while controlling resistance, privacy issues, and integration complexity (Alnofeli et al., 2025; Salah & Ayyash, 2024; Yoo et al., 2024). Dynamic capabilities, such as sensing opportunities, seizing solutions, and reconfiguring processes, enable MSMEs to adopt conversational technologies and adapt structures as the benefits of these technologies scale (Aljarboa, 2024; Haq, Suki, Zaigham, et al., 2025; Saeedikiya et al., 2024). In resource-constrained contexts, gradual adoption with clear value targets, closing skills gaps, access to funding, and infrastructure upgrades help mediate the relationship between organisational readiness and performance outcomes. Open innovation roadmaps and partnerships with technology providers further support scanning, testing, and scaling stages, allowing MSMEs to leverage external expertise without overextending internal resources (Appio et al., 2024; Rajaram & Tinguely, 2024; Wei & Pardo, 2022).

The ecosystem and governance layer emphasises risk mitigation and sustainable scaling. Studies on innovation resistance confirm that privacy risk, time risk, and technological anxiety influence attitudes and intentions, necessitating clear information, user control, and routes to human agents for complex cases to maintain trust (Choudrie et al., 2023; Kwangsawad & Jattamart, 2022; Muhammad et al., 2025). Regulatory frameworks that provide certainty and risk guidelines, such as emerging collaborative governance schemes in AI

regulation, reduce compliance uncertainty while protecting customers' fundamental rights (Cancela-Outeda, 2024; Carayannis et al., 2025). In the longer term, usable and useful experiences intersect with triple-bottom-line outcomes and sustainable brand identity, providing micro- and small-business owners additional normative reasons to maintain investment in conversational AI (Abrokwah-Larbi, 2024; Bahaw et al., 2025; Jobstreibizer et al., 2025). Empirical work on MSME customer focus suggests that chatbot key performance indicators should be explicitly linked to customer metrics such as satisfaction, resolution time, retention, and average order value so that adoption remains anchored in clear business objectives (Haq, Suki, Zaigham, et al., 2025; Ingaldi & Klimecka-Tatar, 2022; Rajaram & Tinguely, 2024; Wasudawan et al., 2025).

Overall, the strategy that consistently emerges is to start from high-value customer conversations, connect them to AI-CRM levers and an MSME-operable data architecture, run measurable pilots with human fallback, strengthen capabilities through training and partnerships, and ensure transparent governance and compliance so that business benefits can be scaled safely.

## CONCLUSION

Cross-study evidence indicates that the impact of AI chatbots on micro and small MSMEs is realised when experience mechanisms and organisational capabilities reinforce one another. The Flow and Technology Interactivity lens posits that readability, transparency, personalisation, and responsiveness trigger an experience flow that enhances communication quality and satisfaction; this mechanism serves as a gateway to the formation of positive customer attitudes. On the acceptance side, TAM and UTAUT, and their variants, map the roles of perceived usefulness, ease of use, social influence, and perceived trust and risk in shaping adoption intentions and decisions. At the readiness level, the TOE framework groups drivers and barriers across the dimensions of technology, organisation, and environment that are specific to the MSME context, including data quality and system integration, management support and skills, and competitive pressure and regulatory certainty. Resource-based capabilities, according to RBV, and the processes of sensing, seizing, and reconfiguring, according to Dynamic Capabilities, explain how investments in AI-CRM, data governance, and channel orchestration transform conversational interactions into sustainable competitive advantages in the Society 5.0 ecosystem, which demands real-time, human-centred services.

The theoretical implication is the need for a model that links micro-mechanisms of conversational experience with user-level adoption processes and organisational decisions at the capability level. Specifically, SLR findings support the mediating role of Flow in the

relationship between interactivity cues and satisfaction, the mediating role of perceived usefulness in the relationship between conversation design and intention, and the moderating role of trust and risk factors in the relationship between intention and actual use. At the organisational level, data and AI-CRM capabilities act as transmission mechanisms that channel adoption into performance, with Dynamic Capabilities positioned as a bridge between TOE and competitive outcomes. The practical implications lead to sequential steps: conversation design that solves customer problems quickly and consistently, proactive response policies with emoji usage ethics and escalation routes to human agents for complex cases, strengthening brand credibility and privacy transparency, especially on voice channels, activating AI-CRM for personalisation and multichannel integration, and transparent data governance so that benefits can be measured through metrics such as first response time, resolution rate, satisfaction, conversion, average order value, and retention. In the context of limited resources, effective strategies start with high-value pilots, short training sessions, technology partnerships that bridge talent gaps, and alignment with applicable policies and regulations.

This study has important limitations that should be noted. First, most evidence still relies on proxy indicators such as purchase intention or continuance. Hence, estimates of the direct impact on actual sales are potentially biased and require verification using longitudinal transaction data. Second, the heterogeneity of contexts across sectors, countries, and levels of digital maturity of MSMEs limits the generalisation of findings, particularly for micro-enterprises operating in areas with limited digital infrastructure. Third, the rapid dynamics in the field of generative AI pose risks of conceptual and practical obsolescence. At the same time, indexing lags, and differences between online-first and in-issue dating may affect the timing distribution of observed evidence. Moving forward, cross-country experimental and quasi-experimental research, long-term field studies linking experience metrics to commercial performance data, and measurable ethical and privacy governance evaluations will strengthen causal validity and enrich the development of theories linking Flow, TAM/UTAUT, TOE, and RBV/Dynamic Capabilities in the MSME ecosystem.

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industry, and government, and inspire subsequent studies that advance inclusive, ethical, and competitive digital transformation.

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