A new competitive edge: crafting a service climate that facilitates optimal human-AI collaboration
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Abstract

Purpose – Capable service employees are increasingly scarce and costly. Many organizations opt to partially replace, support, or augment human employees with AI systems. This study builds a framework to help managers map and understand challenges of crafting a service climate that fosters synergies between AI and human employees, where customers require value-added, personalized, and excellent service.

Study design/methodology/approach – This conceptual article identifies barriers and facilitators of building a service climate for organizations using both human and AI-based employees, through an eclectic review of relevant literature.

Findings – A conceptual framework is built, and a future research agenda is brought forth.

Originality – This research builds on Bowen and Schneider's (2014) seminal service climate framework to account for a mix of human and AI-based employees.

Research limitations/implications – By identifying barriers and facilitators for AI-human synergies in service settings, this article clarifies how AI can be made to complement human employees, especially in delivering personalized, value-added services, while also highlighting knowledge gaps.

Practical implications – This study provides a practical framework for integrating AI into the workforce. It offers insights into addressing challenges in creating a service climate that combines human and AI capabilities to maintain service excellence. Identifying key barriers and facilitators, the framework guides managers to improve efficiency and customer satisfaction in a rapidly changing service landscape.

Social implications – This research offers insights on incorporating AI to address labor shortages while maintaining high-quality, personalized service. It provides a pathway to improving service experiences, especially in sectors facing staffing challenges from an aging population.

Keywords: Artificial intelligence, AI, service climate, organizational culture, employee, technology adoption.

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1. Introduction

High-end service organizations that offer complex and rich services (e.g., healthcare, airlines, hospitality, tourism, and professional service providers) mostly depend on the availability and quality of human resources for the provision of high-quality individualized service to their customers (Frei, 2008). Service provision in this domain is costly due to labor intensity, and capable employees are increasingly scarce. Human skills can be cost-efficiently substituted by or extended, augmented, and complemented with artificial intelligence (AI) tools (Tschang and Almirall, 2021), increasingly so with the arrival of large language models (LLMs) that are built into easily navigable systems, such as ChatGPT, Bing AI, and Google Gemini. This article utilizes Davenport *et al.'s* (2020) definition of artificial intelligence (AI) as the "programs, algorithms, systems and machines that demonstrate intelligence" (Shankar, 2018, p. vi). AI is "manifested by machines that exhibit aspects of human intelligence" (Huang and Rust, 2018, p. 155) and involves machines mimicking "intelligent human behavior" (Syam and Sharma, 2018, p. 136). These systems may play the role of a collaborator, manager, assistant, or colleague to their human peers. A study conducted by the Massachusetts Institute of Technology (MIT) on a sample of 1,419 marketing executives revealed that professional service marketers recognize the strategic value of integrating AI and machine learning (ML) models into customer-facing functions, as they potentially create a competitive advantage in service categories characterized by complex buying decisions and frequent changes (MIT Technology Review Insights, 2018). AI-based "colleagues" may indeed be able to motivate, inspire, advise, criticize, and support human employees while also being able to execute activities that reduce these human employees' workload, such that human employees can focus on higher-level or more complicated tasks. Although the advent of AI-based technologies creates many opportunities, there are also challenges, often resulting from suboptimal collaboration environments. Human employees may, for example, feel uncomfortable sharing

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sensitive information or ideas with AI-based collaborators out of fear that this information may be abused, wrongly interpreted, or diffused. Similarly, consumers trust brands less when interacting with AI than with humans (Lefkeli *et al.*, 2024). In a number of ways, the relationship between humans and AI will probably remain different from their relationship with - and acceptance of - other new technologies: AI is fundamentally different from previous technological innovations, because of the potentially omniscient and omnipresent nature of AI and its ever-lasting and infallible memory and profound analytical skills. Whereas a human boss or colleague almost certainly suffers from information overload and a fallible and smoothening memory and cognitive capabilities, AI-based colleagues may - under circumstances - be much less forgiving. Therefore, in many ways the relationship between humans and AI-based colleagues will probably remain fundamentally different from that among humans for the foreseeable future.

Humans are new to working together with AI-based colleagues, and organizations have little to no experience in integrating these two distinct types of workers in heterogeneous work and service teams. The challenges of creating optimal working conditions for such a mixed population of human and AI-based workers (robots, AI assistants, AI friends, etc.) are not fully understood. Although substantial research is available on the organizational requirements and conditions for the delivery of high-quality service in purely human organizations (i.e., a service climate), it is not known which conditions should be fulfilled for a mixed workforce of humans and complementary AI-based workers.

In this research, the challenges of optimizing human–AI collaboration and creating conditions for sustainable AI integration in work and service teams are addressed, specifically in complex, personalized, and high value-added service categories, including medical care, insurance, legal support, high-end tourism and travel, and private banking. This research addresses i) how service organizations can create a service climate that supports optimal

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collaboration (e.g., distribution of tasks and responsibilities, exchange of information, exchange of resources) between human and AI-based actors in work or service teams and ii) how these conditions for collaboration among human and AI-based employees can be integrated into the service climate concept to support organizations with the smooth integration of AI. This research maps the challenges that threaten integration and optimal collaboration between humans and AI-based workers in service or work teams, as well as the opportunities for establishing a service climate that fosters human–AI collaboration.

Seminal work has been done on *service climate* as a precondition for excellent service delivery by organizations (Hong *et al.*, 2013; Schneider *et al.*, 1998). This research utilizes the service climate framework proposed by Bowen and Schneider (2014), along with adaptations to facilitate collaboration between human and AI-based employees while preserving the desired productivity and working conditions required for excellent service. We utilize the definition of service climate that states that service climate is the communication that employees receive about the importance of service within their firm, which extends to customer orientation, managerial practices, and customer feedback (Schneider *et al.*, 1998; Schneider and Bowen, 1995; Shainesh and Sharma, 2003).

In the following sections, the core concepts of the study are defined, and the relevant background literature is discussed. First, service categories in which human–AI collaboration is most urgently needed are identified. Then, the concept of a service climate is discussed. Finally, several challenges of integrating AI into service organizations and potential avenues for future research are discussed, along with how this integration could contribute to creating a sustainable competitive advantage in service organizations.

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2. Conceptual background
2.1 Complex and high value-added service categories

Not all service categories require—or benefit from—the integration of human and nonhuman resources to improve their performance or efficiency. Simple and low-touch services that require little input from customers can be performed perfectly well by humans or AI-based service employees (i.e., self-service technologies) alone. However, high-quality and complex services that require individualized approaches (healthcare services, private banking, high-end tourism and travel, legal advice, etc.) could benefit substantially from the seamless integration of human and AI-based resources. Zhang *et al.* (2021) argue that in this context, the integration of AI and human resources needs to be coordinated by the organization in question in such a way that the created unified work or service teams harness the unique abilities of both human and AI-based agents to address complex challenges and drive the organization toward success. Braun *et al.* (2023) argue that humans, in such a collaborative environment, may contribute through unique qualities, such as creativity, empathy, and adaptability, enabling them to handle idiosyncratic and dynamic environments and tasks. At the same time, AI can contribute by processing substantial amounts of (complex) information and data much faster than humans and by identifying patterns that may elude humans.

2.2 Service climate

Excellent service has been associated with desirable attitudes and behaviors in customers, such as satisfaction, loyalty and engagement, and superior long-term financial performance of firms (Wirtz and Lovelock, 2021; Bowen and Schneider, 2014). In the realm of service organizations, the notion of a *service climate* has been introduced, facilitating the delivery of excellent service to customers (Bowen and Schneider, 2014). This notion relates to the overall perception held by service employees regarding the policies, procedures, and practices implemented within the organization to improve service quality (Schneider *et al.*, 1998). This perception is based on

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the observation that specific behaviors are encouraged, anticipated, and acknowledged by the organization (Bowen and Schneider, 2014; Schneider *et al*., 1998).

Employee behavior is reflected in customer evaluations, attitudes, and behaviors (Bowen and Schneider, 2014; Liao and Chuang, 2004), and a strong positive relationship exists between the perception of a service climate among service employees and the perceived quality of service by customers (Bacile, 2020; Schneider *et al.*, 1998). Therefore, creating and maintaining a positive service climate is crucial for organizations (Johnson, 1996; Manthiou *et al.*, 2023) and, by extension, for service organizations in the age of AI.

2.3 Reasons to integrate AI

Service organizations integrate AI into their operations for multiple purposes and reasons. In terms of purposes, Raisch and Krakowski (2021) distinguish between automation and augmentation, where *automation* refers to the integration of AI-based technologies to more efficiently address complex but routine tasks, such as completing expense claims, answering emails, and setting up meetings, whereas *augmentation* refers to combining humans and machines to more effectively accomplish unique—that is, non-routine—tasks to enhance outcomes. Relevant research on AI integration in a service context is summarized in Table 1.

----- Insert Table 1 here -----

The integration of AI into service organizations may—through automation, augmentation, and combinations thereof—structurally enable these organizations to better achieve multiple key objectives and thus create a sustainable competitive advantage. The following objectives can be distinguished:

(1) Enhancing operational efficiency and productivity, e.g., by freeing up employee capacity through the (partial) automation (Braganza *et al.*, 2021) of business processes. This is especially relevant in the context of complex and personalized service, where good employees are increasingly scarce and expensive (Nicolescu and Tudorache, 2022; Wamba-Taguimdje *et*

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al., 2020). According to the Organization for Economic Cooperation and Development (OECD, 2023), the primary motivation for adopting AI in the workplace is to improve employee performance and productivity (Lane *et al.,* 2023). AI bots can assist human agents with routine tasks and free them up for more complex cases (Davenport *et al.*, 2020). Zhang *et al.* (2021) also suggest that AI can provide guidance and assistance to human employees, thus enhancing their ability to provide excellent service. Makridis and Mishra (2022) observe that the growth of the number of AI jobs in organizations may also improve subjective well-being in employees, which could be a consequence of employees experiencing assistance in their jobs and the ensuing increase in performance.

(2) Optimizing customer experiences and services (Wamba-Taguimdje *et al.*, 2020) by better addressing the diverse and heterogeneous needs of customers (Baltas *et al.*, 2013), thus enhancing customer engagement and improving market presence (Aversa and Hueller, 2023). AI technologies can be incorporated into frontline services to enhance service quality and provide value for customers by allowing more personalization and customization of these services, the optimization of customer order fulfillment, and more effective customer relationship management. In this scenario, service organizations could, for example, utilize AI to more accurately identify or predict customers' preferences and proactively provide services without a formal order from customers (Davenport *et al.*, 2020). Similarly, in a review of 250 articles and through qualitative interviews with customers, Burton (2022) found that customer service overall "will work better when certain tasks, workflows, and activities are automated and added to the CS [customer service] experience" as an enhancement rather than as a replacement of human customer service agents (p. 88).

(3) Innovating and developing new business models in the ever-changing market landscape and streamlining supply chain relationships (Wamba-Taguimdje *et al.*, 2020). Aversa and Hueller (2023) propose the idea of digital diversification as a form of service and

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business model diversification that is enabled by digital and AI-based technologies. This concept involves taking advantage of new opportunities, e.g., for hyper-personalization, created by AI and other digital technologies.

(4) Automating quality management investigations and recommendations. The adoption of AI and associated technologies, such as machine learning, deep learning, neural networks, chatbots, and virtual assistants, are revolutionizing the core operations of businesses and organizations, as they allow these entities to detect errors and fraud more effectively and automatically in sectors such as insurance, auditing, banking, and other financial service sectors and to automate threat intelligence (Wamba-Taguimdje *et al.*, 2020).

(5) Improving business processes and marketing applications, where AI can help produce insights based on data (Davenport *et al.*, 2020). Leavy (2023) argues that AI adoption can help improve business processes in several ways, including speeding processes up, fueling business process innovation by providing insight into obstructions, improving the process of complex decision-making, and reducing the risk of fraud and waste.

How well organizations integrate AI−for the purposes outlined above−may influence the quality and value of their service and their competitive position. According to the resource-based view (Barney, 2001), organizational AI-integration capabilities can be seen as a unique resource that is heterogeneously distributed in the market, with prohibitive costs for reproduction and barriers to imitation (Krakowski *et al.*, 2023). Thus, the extent to which the collaboration and distribution of tasks between AI and human agents can be leveraged may establish sustainable competitive advantages for organizations.

The distribution of tasks among human and AI-based service employees can be achieved either by dividing tasks into subtasks, using AI capabilities to handle some parts and human strengths to take over the rest (Raisch and Krakowski, 2021), or by integrating human and AI agents in performing the same task (Krakowski *et al.*, 2023). Below, the adapted model

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of a service climate that supports AI integration is discussed, reflecting antecedents of AI integration related to organization and human employee engagement in service organizations (see Figure 1).

<p align="center">*** Insert Figure 1 about here ***</p>

3. Organization-related antecedents of service climate in the context of AI integration

Which types of resources, skills, and capabilities do organizations require to accomplish a smooth integration of AI and human resources in a context where service excellence is crucial? Bowen and Schneider (2014) propose leadership, human resource management (HRM) practices, and systems support as drivers of a positive service climate. In this section, these aspects, along with some new elements, which are especially relevant in the context of integrating AI into complex services, are discussed, thus extending the service climate framework for AI integration.

3.1 Leadership

Organizational change, especially disruptive transformations such as the adoption and integration of AI, often creates uncertainty, and addressing this uncertainty is crucial to obtaining desirable outcomes in service organizations. Introducing AI as a coworker requires balancing and managing multiple challenges and dialectical tensions (Koponen *et al.*, 2023). Leaders need to prepare, motivate, and equip employees to make the required changes and adapt to the new context. While the importance of leadership in change processes has been extensively discussed in previous literature (see Bowen and Schneider, 2014 for an overview), the role of leaders in effectively integrating rapidly developing and advanced new technologies, such as AI, remains underexplored (Matsunaga, 2022). To address this issue, three key antecedents of leadership in the AI age are investigated: AI literacy, as a new critical component in a service climate optimized for human–AI integrated service organizations;

vision and change management; and leadership style. These have been adapted from previous literature to fit the new AI-infused service environment.

AI literacy: Increasing digitization, especially the integration of AI into organizations, requires a new set of leadership capabilities. A significant challenge arises from the gap between leaders' AI literacy and the rapid pace of technological advancements. Watson *et al.* (2021) advocate digital proficiency as a critical skill for future leaders, particularly highlighting the significance of understanding AI developments. Leaders who lack a comprehensive understanding of AI's capabilities *and* limitations face difficulties in effectively integrating AI into their workforce and leveraging its full potential (Brock and von Wangenheimz, 2019). Matsunaga (2022) argues that it is hard to envision leaders without sufficient tech-savviness and AI knowledge effectively inspiring their teams to navigate the complexities of AI integration. This author further argues that when employees perceive a leader to be lacking AI literacy, the leader's effectiveness may be diminished.

In the context of exponential technological change, it is critical to possess the ability to quickly learn and adapt. In those contexts, transformational leadership styles are considered an important vehicle of change. However, a lack of AI literacy may interfere with leaders' capability to effectively exercise those transformational leadership styles.

A learning mindset thus provides the foundation for adapting existing and developing new leadership competencies (Watson, 2021). Leaders should learn on an ongoing basis and continue to improve their digital and AI literacy. This literacy begins with a foundational understanding of AI itself, including diverse types of AI, their functionalities, and inherent limitations. This knowledge enables leaders to assess potential opportunities for AI integration within their service delivery processes. A deeper understanding of technological possibilities enables leaders to create an adequate vision and inspire employees to get involved (Kane *et al.*,

2019). Meanwhile, demonstrating relevant expertise enhances a leader's credibility with the workforce, stakeholders, and customers (Cortellazzo *et al.*, 2019).

Vision and change management: A shared vision is a strategic organizational resource that can align and enhance organizational capabilities. When employees feel that they are part of a community that shares aspirations and strategic directions, they are encouraged to invest their energy collectively in the realization of these shared goals (Eldor, 2020).

AI is not a simple plug-and-play technology with immediate returns, especially for businesses that are not "born digital" (Fountaine *et al.*, 2019). Leaders need to effectively manage the change process associated with integrating AI and address potential resistance from or concerns among human employees. These call for a well-defined vision that presents the future strategic direction of the organization and provides a basis for action among the organization's members (Pearce and Ensley, 2004). This vision needs to be adapted to reflect the new opportunities (and challenges) encountered with AI integration. Without a clear view of how humans and AI should collaborate, employees may struggle to adapt their work processes and effectively leverage AI's capabilities (Mirbabaie *et al.*, 2022), leading to confusion and quality issues in service delivery. Traditionally, leaders have been responsible for communicating the organizational vision and mission and motivating employees to work toward achieving organizational goals (Bowen and Schneider, 2014). In a service environment in which AI and humans collaborate, leaders must go beyond simply conveying the vision but be prepared to present and discuss it in such a way that prepares employees for changes in their work environment and helps them embrace the associated uncertainties with confidence and an optimistic outlook (Matsunaga, 2022).

Leaders need to take the initiative in developing a compelling vision about how human and AI employees collaborate to deliver exceptional personalized service. This vision should act as a guide, outlining the advantages and challenges of AI integration into service delivery

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(Huang and Rust, 2021). Furthermore, the vision should clearly define the roles and responsibilities of different employees, emphasizing the unique strengths of both AI (e.g., data analysis, rapid calculations) and humans (e.g., empathy, creativity, social skills).

Leadership style: Effectively leading the creation of a service climate that fosters constructive collaboration between AI and human service employees presents a unique challenge. Traditional static leadership approaches may struggle to address the multifaceted dynamics at play. A rigid hierarchical style might stifle innovation and collaboration, hindering the teamwork needed for successful human–AI interaction (Munyaka *et al*., 2023). Conversely, an overly permissive approach might lack the direction and vision necessary to navigate the initial uncertainties of AI integration.

Mastering leadership agility could be key to fostering successful human–AI service collaboration. Leaders need to be adept at strategically shifting their style based on their team's specific context and needs. During the initial phases of change (e.g., the introduction of AI collaboration), a transformative approach that inspires and motivates employees and provides a sharp vision for the future can be crucial (van Dun and Kumar, 2023). As employees become more comfortable with AI, leaders can transition to a more participative style, fostering collaboration and soliciting feedback as the human–AI partnership takes shape. Finally, ongoing coaching and individual support are essential for success. By fostering a culture of continuous learning and development, leaders can empower their teams to adapt their skill sets and thrive in this new service climate.

3.2 HRM practices

New team structures that integrate interactions and collaborations between human and AI employees need to be shaped, which may challenge extant HRM practices. HR managers need to find ways to optimize the interactions of these two kinds of employees with different competencies. Here, the authors follow Bowen and Schneider (2014), who acknowledge the

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importance of HRM systems as elements of social contexts, as well as the role of staff selection and training. However, the authors of the present article contend that in an AI context, special attention must be paid to performance management.

Recruitment and training: AI can take over some tasks and even engage socially with customers. However, the current lack of intentionality and emotions may prevent AI from reaching common ground with customers (Belanche *et al*., 2021). Huang and Rust (2018) also emphasize that service employees are better at "softer" intuition and empathy skills. Traditional methods in recruitment and training primarily focused on identifying candidates with strong analytical skills and domain expertise may not be sufficient for success in a human–AI collaborative environment. Existing employees accustomed to working independently may require significant upskilling and adaptation to navigate the complexities of collaborating with AI teammates (Zirar *et al*., 2023). This requires changes in HRM practices and a shift in mindset for both recruiters and employees.

Performance management: Evaluating how well humans and AI work together effectively poses challenges for HR performance management. Traditional metrics focused on individual output may not capture the added value created by human–AI collaboration (Arslan *et al.*, 2022). It may also be challenging to distinguish between the contributions of human and AI employees to service interactions. AI can efficiently gather and process customer data, while a human advisor may use empathy and expertise to craft a personalized solution (Vassilakopoulou *et al.*, 2023). Traditional systems may overlook some critical aspects, such as communication flow, shared decision-making processes, and the overall constructive collaboration within the service team. These issues can lead to confusion, frustration, and a lack of responsibility among employees. Other authors have examined how the introduction of AI impacts a sense of "interactional justice" and how its proper implementation will "support feelings of respectful workplace treatment" (Bankins *et al.*, 2022, p. 873).

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Therefore, HR departments need to develop new performance measurement systems with a broader range of metrics. It is necessary to delve into the effectiveness of human–AI collaboration, teamwork dynamics, and the overall customer experience (Robinson *et al.*, 2020). This could include measuring how accurately and efficiently human employees use AI insights, how smoothly handoffs between human and AI service providers occur, and how effectively the team tackles complex customer issues. Furthermore, implementing team-based performance evaluations can foster a more collaborative service environment (Uribe *et al.*, 2022). By rewarding teams for achieving shared goals and recognizing the collective value proposition of human–AI collaboration, these evaluations can facilitate effective teamwork and communication within the service team.

3.3 Systems support and data management

Various functions within an organization, such as operations, marketing, and information technology (IT), may support the development of a favorable service climate (Bowen & Schneider, 2014). Research in information management suggests that ancillary support (e.g., a customer relationship management system) can improve the service climate (Jia and Reich, 2013; Wang *et al.*, 2021). In the present article, it is suggested that, in the context of AI integration, this kind of support often depends on the quality, legitimacy, and security of data management.

Bowen and Schneider (2014), in the original service climate framework, focused on systems support in general. In the context of AI integration, IT support must focus specifically on data management for three key reasons. First, AI requires vast amounts of high-quality data to learn from—and collaborate effectively with—humans in real-time scenarios. The Global Artificial Intelligence Infrastructure Investment Partnership, which includes partners such as Microsoft and BlackRock, aims to raise $100 billion to develop data centers and the necessary energy infrastructure to handle this vast amount of data (Novet, 2024). Second, users must be

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able to validate data to ensure their accuracy and relevance to addressing specific workplace situations. For instance, social media platform X introduced a feature that enables users to share their interactions with the platform, helping to improve the performance of their AI chatbot, Grok (Evans *et al.,* 2024). This may allow AI to better understand users and provide more relevant responses. Third, there needs to be a robust privacy and security management process in place to collect, use, and store user data without compromising the ethical standards of users and employees. For instance, experts predict that, in the short term, integrating AI into the service sector will lead to stronger cybersecurity checks and balances, setting the stage for the development of responsible AI that ensures accountability in data security (Gandzeichuk, 2024). Given the need for comprehensive data management, the present article argues that effective human–AI collaboration hinges on robust data management support.

Data quality: The very foundation of effective human–AI collaboration in service delivery rests on the quality of the data used to train the AI (Shabani-Naeeni and Yaghin, 2021). The first challenge lies in obtaining sufficient data. For AI to be able to effectively support human employees in complex service scenarios, training data need to encompass the richness and variety of situations encountered. Limited data can lead to situations in which AI lacks the necessary context to accurately understand, interpret, and respond to specific customer needs. Furthermore, the data need to be broad and detailed enough to capture the diversity of customer needs and experiences. A narrow dataset focused solely on a specific customer demographic or service type will limit the AI's power to generalize and hinder its ability to support human employees across a wide range of customer interactions. This can lead to situations in which AI provides biased recommendations or inaccurate insights, detrimentally impacting the quality and personalization of the service experience.

Data legitimization: Human–AI collaboration requires a diverse and abundant data landscape. Organizations need to leverage a variety of data collection methods, including those

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that collect historical customer interaction data and data from social media platforms (with appropriate privacy safeguards), customer surveys and feedback forms, and even industry reports, to capture a broad picture of customer needs and trends (Bednarz and Manwaring, 2022). Furthermore, organizations can implement active learning strategies where AI itself identifies knowledge gaps and proactively requests additional data for specific situations. This can be achieved by integrating human-in-the-loop mechanisms through which service representatives can flag complex or unforeseen interactions and provide additional context or feedback to the AI. Over time, this interactive learning process can continually broaden the AI's knowledge base and improve its ability to enhance human employees across a wider range of complex customer interactions.

Data security: Privacy regulations affect AI development and integration in organizations. For example, the General Data Protection Regulation (GDPR) in Europe implements strict privacy requirements concerning the way firms handle and store personal data. However, there is a potential conflict between data security and AI effectiveness. Stringent data security measures, while crucial for safety and trust, can limit the availability of the data needed to train and refine AI models (Kaplan and Haenlein, 2020). Restricted access to customer data might hinder the AI's ability to learn and adapt to evolving customer needs and preferences. Furthermore, the complexity of data privacy regulations across different countries and regions can pose challenges for organizations operating globally (Tehrani *et al.*, 2024). Organizations need to adapt and build complex data management systems and procedures, which potentially increases the risk of human error or data security breaches. Moreover, evolving privacy regulations can introduce uncertainty regarding data collection and usage practices, making it difficult for organizations to establish a clear and transparent data governance framework.

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Service organizations need to ensure customer protection–oriented data security. First, these organizations can minimize data collection by strictly conforming to AI training necessities and anonymizing personally identifiable information wherever possible. In this way, organizations can mitigate the risks associated with data breaches while still providing AI with sufficient information to learn and perform effectively. Second, organizations should invest in robust data security infrastructure and procedures, including state-of-the-art encryption technologies, regular security audits, and employee training on data privacy best practices. Furthermore, establishing clear data governance frameworks that comply with all relevant regulations is essential. These frameworks should explicitly outline data collection, storage, and usage practices and be communicated transparently to customers. By prioritizing data security and transparency, organizations can build trust with customers and foster a service climate conducive to effective human–AI collaboration (Blaurock *et al.*, 2024).

4. Employee-related antecedents of service climate in the context of AI integration

Employee engagement is defined as "a positive work-related psychological state characterized by a genuine willingness to contribute to organizational success" (Albrecht, 2010, p. 5). A service climate is easier to build on a foundation of highly engaged employees. In the previous section, the antecedents of service climate at the organizational level were discussed. In this section, the foundations of employee engagement are discussed from an individual perspective. Bowen and Schneider (2014) propose that establishing employee engagement depends on work-supporting resources, challenging work characteristics, and fair treatment. However, employee engagement – and therefore the service climate - is threatened in organizations that integrate AI into their operations, because they often face various forms of resistance from the existing workforce for multiple reasons (Mirbabaie *et al*., 2022). Faced with fundamental changes and the introduction of AI partners, employees tend to be concerned about whether

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they will be replaced and the degree of initiative left for them at work. Therefore, employee engagement – as a foundation of service climate - in the context of AI integration is suggested to depend on the following aspects: control about workflows, autonomy in decision-making, and trust regarding AI colleagues.

4.1 Control

Control refers to the designation of who makes decisions and manages the workflow within service operations. This includes assigning tasks, addressing complexity, and ensuring effective and efficient service operations. The extent to which employees feel in control is a crucial factor that influences their interactions with coworkers (Bitner *et al.*, 1994). Research has emphasized the positive correlation between employees' perceived control and job satisfaction, commitment, and performance (Spector, 1987). Introducing AI in organizations comes with the fundamental challenge of maintaining a delicate balance between the level of control desired by humans and the autonomy exhibited by AI (Paluch *et al.*, 2022). This challenge relates to two dimensions of organizational design: division and allocation of tasks and decision-making authority.

Division and allocation of tasks refers to the definition of clear boundaries for task ownership. AI excels at data analysis, pattern recognition, and repetitive tasks. Humans excel at complex problem-solving and nuanced judgment. Assigning tasks to AI that are beyond its capabilities can lead to errors and inefficient workflows. Similarly, burdening humans with repetitive tasks can lead to disengagement and hinder overall team productivity.

Decision-making authority refers to determining who has the final say when delivering a complex service, which has consequences for service effectiveness and employee experience. For example, imagine a scenario in which an AI employee identifies a potential service disruption based on the data analysis it conducted. While AI can flag the issue and determine the optimal solution, should it have the authority to automatically implement corrective actions

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and potentially overrule human colleagues? Conversely, if every decision requires human intervention, this can delay the team's responsiveness and reduce AI's effect on the efficiency of service operations.

4.2 Autonomy

The extent to which employees perceive autonomy is a foundational requirement for performance related to the basic human needs of personal development and growth (Ryan and Frederick, 1997). In the context of service operations, autonomy is also an organizational design factor and refers to the level of independence each team member (human and AI) has in completing their assigned tasks and making decisions within established parameters. The following challenges may exist:

Fear of substitution: Employees may feel threatened by AI's capabilities and may fear job displacement. This can lead to disengagement and a decline in overall service quality. For example, Huang and Rust (2018) suggest that upgrading AI's role in the company from doing repetitive mechanical tasks to intuitive thinking tasks may be seen as a threat to human employees' jobs. Meyer *et al.* (2020) interviewed frontline employees and identified sources of resistance in several dimensions, including fear of a loss of status (e.g., uncertainty about the future, fear of degradation), tensions (e.g., disruption of routines), required commitment (e.g., changes in responsibilities), and role incongruence (e.g., social-emotional callousness, functional incompatibility). These fears are substantiated, as a recent example described by CNN shows: Summit Shah, the founder and CEO of Dukaan, a Bengaluru-based e-commerce company, announced on Twitter that he had replaced 90% of staff with an internally developed chatbot that can instantly respond to customer queries (Cooban, 2023).

Fear of subordination: Apart from (partially) replacing customer service employees, AI can also be used to manage employees. Algorithmic management technologies are meant to minimize inefficiency; however, what an algorithm sees as inefficiencies may actually be

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the breaks that employees need to sustainably deliver high-quality service (Dzieza, 2020). Furthermore, algorithmic management may lead to an increase in stress and a decrease in workers' autonomy. This effect may be particularly strong among women, immigrants, and people of color, as shown by Spektor *et al.* (2023) in a study on the effects of algorithmic management tools in the hospitality industry.

Job satisfaction: Working with AI may affect job satisfaction. Vorobeva *et al.* (2023) argue that human employees tend to experience negative feelings in the presence of AI-based colleagues when doing thinking tasks. Moreover, the presence of AI can induce the feeling of cognitive inferiority in human employees, leading to a fear of losing their jobs (Vorobeva *et al.*, 2023), suggesting that even tasks led by AI can trigger emotional setbacks for human workers in the workplace. This underscores the importance of task allocation within various forms of task classifications (technical vs. feeling or intuitive) to foster more effective collaboration between humans and AI.

AI-flexibility: AI systems might struggle to adapt to unforeseen circumstances or unique service scenarios that require creative solutions. Rigid AI protocols can lead to inflexible responses and hinder the team's overall effectiveness.

To address these challenges, employees' autonomy should be prioritized. Recognizing and accommodating employees' desire for autonomy is crucial to designing collaborative relationships. Yalcin and Puntoni (2023) argue that companies' internal communications about AI should stress AI's potential to complement employees rather than the idea that it is going to replace them. Paluch *et al.* (2022) found that the level of autonomy exhibited by AIs significantly influences employees' willingness to collaborate with them. Human employees should always maintain a superior role, while AI should occupy subordinate roles by assisting employees in their tasks and should not autonomously make decisions without involving human coworkers.

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Tasks can be delegated to AI or performed jointly, but human employees must have the ability to supervise and intervene (i.e., human-in-the-loop[1]). This sense of control also facilitates trust, described as collaborative control (Fong *et al.*, 2003), in which AI executes tasks based on specific commands and input from humans. AI enhances human service providers' capabilities, and collaboration is feasible when humans maintain superiority and control (Buhalis *et al.*, 2019; Larivière *et al.*, 2017). Research shows that employees are willing to collaborate with AI only when they have full confidence in and awareness of control (e.g., Simon *et al.*, 2020). Autonomy enhances human–AI interaction, allowing customers to choose between AI efficiency and traditional human service for personalized interactions (Breazeal *et al*., 2004).

4.3 Trust

Trust is a fundamental condition for any type of collaboration (Putnam *et al*., 1993) and can be seen as a crucial element for the success of mixed human–AI teams. Hancock *et al.* (2011) define trust as "the attitude that an agent will help achieve an individual's goal in a situation characterized by uncertainty and vulnerability" (p. 3). Trust, in this context, refers to the ability of humans and AIs to rely on each other's capabilities, integrity, and benevolence (Mayer *et al*., 1995) and effectively communicate within the team. Bowen and Schneider (2014) suggest that firms can engage employees by supporting them with relevant resources, defining challenging tasks adequately, and promoting fairness in all parts of work, leading to employees' trust. In each of the three dimensions, trust is required among human employees, which can be adapted as follows to the context of AI integration:

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[1]Human-in-the-loop is used in multiple contexts but can be defined as including humans in the creation and testing of machine learning models.

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Ability-based trust, i.e., transparency and explainability: Humans need to be able to understand and validate how recommendations and actions generated by AI are reached and trust the AI to indeed be able to reach optimal recommendations or decisions. Opaque AI outputs—without explanation and transparency—hinder collaboration as humans struggle to assess their validity and integrate them into service processes. Employee acceptance of high AI autonomy, i.e., trust, is possible, provided AI can reliably signal failures. Predictability positively correlates with trust, as does system transparency and revealing AI decision-making logic, such as in explainable AI (Schadelbauer *et al.*, 2023). This trust endures even if AI is not fully reliable if humans can intervene when necessary (Baker *et al.*, 2018).

Integrity-based trust or intra-team communication: To achieve shared goals, human team members should trust their AI counterparts to safeguard the interests and well-being of every team member (Mayer *et al.*, 1995). Establishing smooth communication channels is crucial. Humans need to be able to communicate with AI openly and clearly about specific needs and situations. Conversely, AI systems should be able to provide clear and actionable insights that facilitate human decision-making.

Benevolence-based trust: Human employees need to trust the AI in the sense that it performs actions in the interest of the team and the organization.

Building and maintaining trust, e.g., after a breach of trust in one of the above dimensions, may not be easy. Simon *et al.* (2020) revealed the crucial roles of appearance and performance in trust-building processes. In terms of *appearance*, on the one hand, similarity to humans makes AI more approachable, fostering trust and increasing employees' willingness to interact. On the other hand, androids were met with apprehension due to feelings of intimidation, resembling the concept of the uncanny valley (Mori, 1970). Thus, human–AI interaction relies on a degree of similarity in appearance with a balanced anthropomorphic design.

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5. Research agenda

Service companies' need for a service climate that facilitates the provision of high-quality service and the range of challenges organizations face when integrating their human and technological resources lead to a call for more research on the integration of AI in service organizations. Guided by the disparities delineated in preceding sections concerning organizations utilizing entirely human versus mixed human and nonhuman workforces, potential avenues for future research are presented below. Both human and AI angles are assumed.

5.1 Leadership-related antecedents of service climate for AI integration

There is a need to better understand how companies can communicate the introduction of AI colleagues in a way that reduces employees' fears and anxieties and how organizations can equip human employees with the necessary resources to bolster their emotional well-being and autonomy. Previous research has shown that anthropomorphizing AI interfaces can have positive effects on customers' responses and company evaluations (Yalcin *et al.*, 2022). However, it is not clear whether employees who need to interact with an AI colleague will react similarly. The uncanny valley hypothesis (Łupkowski *et al.*, 2019) suggests that varying levels of overly human AI may trigger reactance.

Psychological safety is important to employee well-being and engagement, as it encourages employees to voice concerns, ask questions, and explore AI-driven innovations without fear of judgment. It can be defined as "a sense of confidence that the team will not embarrass, reject, or punish someone for speaking up. ... It describes a team climate characterized by interpersonal trust and mutual respect in which people are comfortable being themselves" (Edmondson, 1999, p. 6). By creating an open and supportive environment, leaders can empower their teams to embrace AI tools confidently and collaboratively, leading to greater adaptability and innovation. Research should investigate what strategies can be

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applied to create a safe environment for human–AI teams and to establish trust in the service team and among teams of varying composition.

5.2 Employee engagement in human–AI collaborations

To support a productive service climate, companies should focus on developing safe environments for employees that increase their well-being and engagement. In the previous sections, challenges and viable solutions regarding these environments were discussed. AI's role as a colleague or assistant emphasizes the importance of coordinating and managing human–AI collaboration. However, as van Doorn *et al.* (2023) point out, research into AI as a work partner is rare. The success of such collaborations may depend on employees' fears (Vomberg *et al.*, 2023) and emotions (Gkinko and Elbanna, 2023), as well as their capability and willingness to work with the new technology. Previous research has shown that employees react differently to recommendations or evaluations made by AI-based managers compared to those made by human managers (Yalchin and Puntoni, 2023). Additionally, people who identify with a particular job or activity may experience the (partial) automation of that job as a threat to their identity (Leung *et al.*, 2018). Future research should investigate the effect of AI colleagues on human employees' fears, autonomy, trust, and identity, as well as the drivers of employee willingness and ability to work with AI.

How humans *feel* when they work with AI is an essential question in a work environment. Dorotic *et al.* (2024) suggest that when individuals evaluate the use of AI applications in public settings, they base their evaluation on a contextual trade-off between two factors: 1) the perceived degree of being exploited by the use of AI in that context, and 2) the extent to which the use of AI increases the focus on providing service. They illustrate this idea through the example of using surveillance cameras in different contexts, where AI surveillance can be perceived to either create more benefits, or more risks, depending on the specific context. This concept can also be applied to the workplace. It can be hypothesized that

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employees may lean toward collaborating with AI when they perceive less exploitation, viewing AI as a facilitator or supportive entity that enhances their task performance. Thus, this raises the question of whether and to what degree AI can understand human insecurity or feelings of exploitation when it collaborates with human employees in a work environment. This is another area in which fundamental research is needed.

Some AI software manufacturers claim that their systems are able to predict if employees are planning to quit (Hess, 2023). Called "predictive attrition" software, and including products such as HR Signal, Retrain AI, and Eightfold AI, companies market this software as tools to support companies in employee retention. Such software can use mouse movement and keystrokes as a guide, but Hess (2023) also wonders, "what if an employee is only casually considering quitting, but after getting flagged by some form of AI as a quit risk, is now hounded by skeptical, or even angry, managers," making the prediction a self-fulfilling prophecy. Such tattling behavior by AI software may add to already existing fears among employees that this new technology is meant to replace them.

5.3 Corporate digital responsibility and AI regulation

The corporate digital responsibility (CDR) literature proposes fair treatment of consumers by ensuring equal treatment of all groups of consumers (Breidbach and Maglio, 2020). The fairness factor from CDR could also be adapted to support the fair and ethical treatment of human employees in an AI environment. Kelley (2022) suggests that employee diversity can reduce systemic biases toward consumers. Can firms enhance productivity through team diversity by integrating AI-based colleagues? What unique values can AI-based colleagues contribute to teams to promote human cooperation? Moreover, how can firms effectively communicate the benefits of diversity to human employees through collaboration with AI colleagues? Addressing negative biases toward AI among human employees appears crucial. How can firms mitigate such biases? Finally, how can firms cultivate a sense of fairness and

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trust among human employees engaged in collaborative efforts with AI within the organization? As regulation in the AI landscape is constantly evolving, so should our conversations on ethics and the appropriate use of AI. Legislation is enacted to ensure applicants are protected when interviewing with firms so that people are not discriminated against by HR AI systems that are empirically biased against certain skin tones and facial features. This research calls for researchers to empirically investigate bias between human and AI employees. Can firms mitigate these effects through anthropomorphism? Or does anthropomorphism amplify these biases? We also call on legal case studies to be brought to the fore in the social sciences when researching biases (e.g., Hofmann *et al.*, 2024), LLMs' hallucinations (e.g., Hicks *et al.,* 2024), and AI's heavy environmental footprint (e.g., Naughton, 2023). Appel *et al.* (2023) discuss legal cases from 2022 and 2023. Such cases hinge on fair use doctrines, e.g., a case Google won "arguing that transformative use allowed for the scraping of text from books to create its search engine, and for the time being, this decision remains precedential" (Appel *et al.*, 2023, p. 4).

Furthermore, AI has been discussed in the context of employees' exploitation by tech companies (e.g., Haskins, 2024). The many ethical issues entrenched in AI led Tacheva and Ramasubramanian (2023) to describe the current age as an AI Empire, which is a system of oppression (see, e.g., Haskins, 2024). When implementing AI in their service teams, organizations should be aware of the ethical issues related to AI and its consequences for employees and customers. Organizations should also try to engage with AI ethically. Future research should investigate the ethical consequences of AI integration in service-oriented organizations.

The explosion in AI usage after the introduction of ChatGPT in November 2022 has led to various security conundrums for corporations that go beyond data breaches and other

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aspects of cybersecurity (Burton, 2022). Some go to the very core of what companies produce and who maintains copyrights, patents, and other aspects of intellectual property (IP).

As copyright law in the US "specifically focuses on non-physical creations or assets made by humans, AI presents a major challenge for legal disputes over patents and IP ownership, namely, who owns AI-generated content" (Caldwell, 2023). Caldwell (2023) also mentions that by pulling random content from the internet, the probability of plagiarism is high. Additionally, if the same prompts are used by different companies, identical responses could potentially be generated by AI, leading to legal issues where it is "difficult to prove copyright infringement or plagiarism when each user creates the work independently" (Caldwell, 2023). Beyond copyright and other IP issues, employees may also worry that AI will report their performance and behavior to their employers. The Wall Street Journal covered meeting software using AI that "acts as a kind of virtual Miss Manners, reminding people to share the mic and to modulate their speaking pace, and advising them how to avoid verbal flubs" (Chen, 2023). While intended to streamline meetings, it can also be used to keep track of individual behavior.

Beyond legal issues, there are also many ethical questions. Some of the examples of AI integration to manage and evaluate employees discussed above mention the issues of surveillance and autonomy. For example, within hiring processes, AI functionality previously assisted firms in screening applicants, but it is now an integral part of screening, hiring, and interviewing applicants. In 2019, this led to regulation in the US state of Illinois (e.g., 820 ILCS 42/ Artificial Intelligence Video Interview Act) to ensure employee/potential candidates' rights are upheld (Friedman & McCarthy, 2020). Similarly, several states are currently reviewing legislation on whether certain AI video screening processes should be considered illegal given potential biases (Friedman & McCarthy, 2020).

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6. Conclusion

This article makes several contributions to the service literature. First, it extends existing service climate theory by integrating the role of AI-based employees alongside human employees. The authors build on the seminal service climate model by Bowen and Schneider (2014) and reflect upon the challenges of integrating human and nonhuman (AI-based) employees in high-end service organizations. The article discusses how complexities and required levels of service quality and personalization necessitate the optimization of the integration of these types of employees and in an updated conceptual model the barriers and facilitators of achieving synergies between AI and human employees in service settings are highlighted. Because integrating human and nonhuman employees is a radically new challenge, this article also proposes a research agenda. An interdisciplinary approach is required to enhance our understanding of how AI could complement human employees, particularly in delivering personalized and value-added services.

Second, for managers, this study offers a practical framework to navigate the complex process of integrating AI into their workforce. From a service climate perspective, this article discusses a range of issues that help managers of these companies prepare for this integration by anticipating the challenges and providing suggestions for solutions. Whereas existing frameworks were limited in their consideration of factors threatening the service climate, the proposed new framework fully considers the challenges organizations face in crafting an AI-human integrated service organization. It is thus indeed important for HR departments to ensure a viable level of AI technology-specific competence in managers and employees before these employees are introduced to working in such collaborative teams (Arslan *et al.*, 2022). Companies should invest in training programs that equip human employees with sufficient levels of AI literacy. This includes understanding AI capabilities and limitations, interpreting AI outputs, and leveraging AI insights for informed decision-making within complex service

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interactions (Vassilakopoulou *et al.*, 2023; Zirar *et al*., 2023). With an increasing reliance on technology in service encounters, scholars have proposed transformed employee roles in service settings, including the roles of enabler, innovator, coordinator, and differentiator (Larivière *et al.*, 2017). For human–AI collaboration to work well, HR should focus on recruiting humans with strong interpersonal skills, emotional intelligence, and the ability to adapt to changing technologies. This change may require HR departments to develop new hiring tools and approaches. This article provides several actionable insights into how to prepare for a service climate that effectively leverages both human and AI capabilities, enabling organizations to maintain service excellence. By identifying key barriers and facilitators, the framework serves as a guide for managers looking to enhance operational efficiency and customer satisfaction in the rapidly evolving service landscape.

Finally, in an era where in many domains service employees are becoming scarce and costly, this research offers insights into how to optimally address these labor shortages while maintaining high-quality, personalized services. By addressing how service organizations can integrate AI and human employees, the study provides a pathway for better service experiences for society, especially in sectors that are facing staffing challenges due to the aging population and workforce constraints.

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Figure 1. Updated service climate framework with AI*
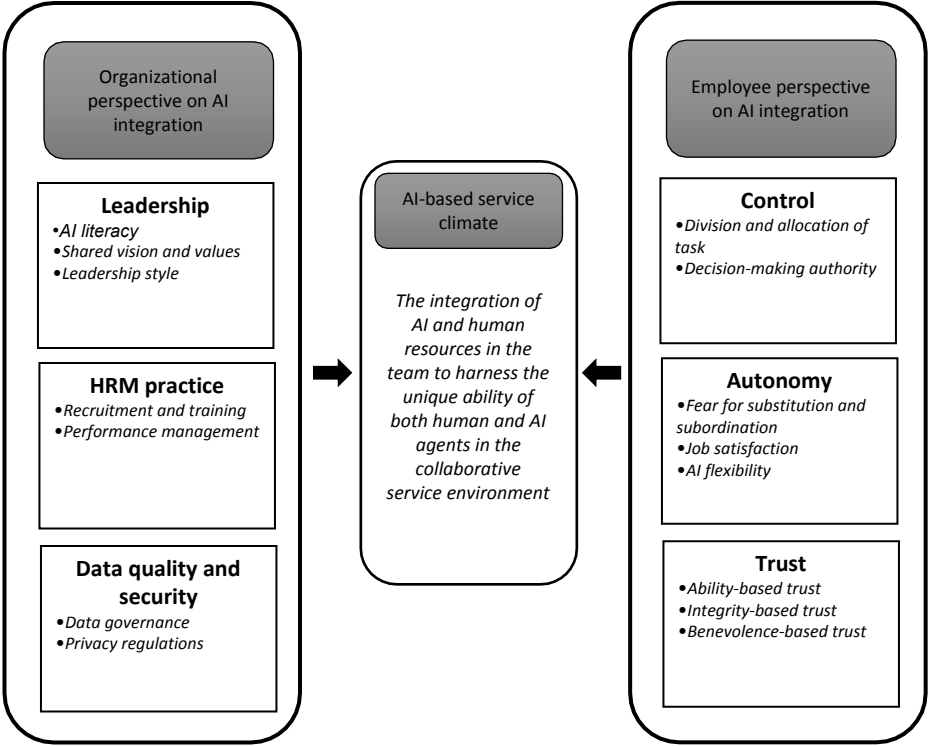
*The above figure was created by the authors

Table 1. Key research on AI integration*

Source	Sector	Research aims/objective	Method	Findings
Adam *et al.* (2021)	Financial service	The impact of AI anthropomorphism and foot-in-the-door approach on customer compliance	Experiment	AI anthropomorphism increases likelihood of customer compliance with AI requests for service feedback
Bermudez-Contreras *et al.* (2020)	Healthcare	Understanding intersections between neuroscience and AI advancement	Review	AI can be used to provide comprehensive understanding of spatial navigation in neuroscience
Crolic *et al.* (2021)	Marketing	Investigating customer responses to anthropomorphism	Secondary-data and experiment	AI chatbots offer benefits like scalability and cost reduction to businesses, but when dealing with angry customers, they can harm firms.
Davenport *et al.* (2020)	Marketing	Investigating AI adoption and future of marketing	Conceptual	AI can be used to optimize the pricing strategies, provide insight into customer preferences, improve inventory control, and predict various customer needs
Eling *et al.* (2022)	Insurance	Impact of AI on the value chain and insurability	Review	AI adoption can provide the opportunity of shifting business models from loss compensation to the loss prediction
Fogel and Kvedar (2018)	Healthcare	Role of AI in the healthcare system	Review	AI allows human agents to devote more time to enhancing their relational, empathy, and judgment skills
Hlee *et al.* (2023)	Hospitality	Investigating the impact of human-robot interaction on the customers' meaningful experience	Survey	Emotional and functional aspects of AI-powered robots enhance customers' meaningful experiences
Pham *et al.* (2022)	Healthcare	Investigating application of AI in the mental health care delivery	Review	AI benefits patients by being cost-effective solution, providing comfort of self-disclosure, and reducing the

				stigma of sharing mental symptoms
Prentice *et al.* (2020)	Hospitality	Impact of employee and AI service quality on customer satisfaction	Survey	AI and employee service quality in hotels significantly influences customer satisfaction and loyalty
Song *et al.* (2022)	Hospitality	Understanding employees' perception in the context of human-robot collaboration	Survey	AI-robots can drive employee performance and effort expectancy which positively impacts job crafting
van Doorn *et al.* (2023)	Hospitality	Understanding implications of customer, worker, and AI interactions	Interview	Employees will develop stronger relationship with customers in an AI-human environment
Wamba-Taguimdje *et al.* (2020)	Information Technology	Understanding impact of AI on IT company performance	Review	AI capabilities allow IT organizations to address cybersecurity concerns, to explore data, and optimize processes
Weber and Schütte (2019)	Retail	Evaluating use and dissemination of AI in retailing	Review	AI can be used for several tasks in retailing such as serving customers, managing orders, transporting products, accounting, analysis, and handing out goods

* The above table was created by the authors