



Embracing digital companions: Unveiling customer engagement with anthropomorphic AI service robots in cross-cultural context

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ABSTRACT

The current understanding of anthropomorphic AI service robots (AISR) remains mostly fragmented in literature. Based on related research and CASA framework, this research aims to combine the fragmented insights of AISR literature by taking holistic view of anthropomorphic characteristics of AISR and its impact on customer engagement and intention to use subsequently. Results are based on two cross-cultural studies, the individualistic culture of Canada ($n = 318$) and the collectivist culture of India ($n = 347$). The outcomes reveal positive associations between anthropomorphic characteristics of AISR and customer engagement, which further affects intention to use. Empathy significantly moderates the relationship between anthropomorphic characteristics of AISR and customer engagement. The cross-cultural nature of this study lays the foundation for design and development of anthropomorphic AISR in different service context.

1. Introduction

The artificial intelligence (AI) industry is projected to be \$1811.8 billion market and will contribute to around \$15.7 trillion globally by 2030 (Alabed et al., 2023; Shah et al., 2024). This movement encompasses the integration of AI across various sectors that includes tourism, hospitality, education, retail, entertainment; where AI is used for several tasks involving service robots, speech recognition, data processing and chatbots. COVID-19 pandemic paved the way to replace humans with AI robots in service sector (Liao and Huang, 2024; Merdin-Uygur and Ozturkcan, 2023). Globally, AI robot market is anticipated to increase from \$41.5 billion to \$84.8 billion between 2023 and 2028 (Kautish et al., 2023b; Markets and Markets, 2023).

Service robot is an evolving technology in digital age that employs AI to deliver customer service (Bregman and Willems, 2023; Jan et al., 2023), thereby deploying AI service robots (AISR) that replaces human-human contacts with human-robot interactions during service encounters (Gauquier et al., 2023). AISR can provide better service quality, cost reductions, skilled manpower, improved productivity, timeliness, engagement and involvement in service context (Lin and Mattila, 2021; Shah et al., 2023). A noteworthy phenomenon to consider for AISR is the emergence of humanoid robots (Mende et al., 2019)

having human-like physiological and psychological states (Huang and Rust, 2018), referred as anthropomorphism (Epley et al., 2007). Anthropomorphic AISR can engage in complicated social interactions, mimic human feelings, and detect consumers' emotions (Kautish et al., 2021b; Murphy et al., 2019). In service context, anthropomorphic AISR can act as social entities that engage various stakeholders through deeper interactions and have been named as social robots (Baudier et al., 2023). Social robots having human-like appearance and social capabilities similar or greater than humans can enhance the customer response (Song and Kim, 2020). As compared to AISR, human employees incline to make mistakes, faulty decisions, unethical acts and feel physical and mental stress, while they are more empathetic, caring, interactive and can provide personalised services (Kautish et al., 2023a; Song and Kim, 2020). Although, anthropomorphic AISR can perform the complex tasks with greater precision and reliability (Kim and Im, 2023), their psychological and social capabilities play important role in service encounters (Khare et al., 2023; Tussyadiah et al., 2020). Anthropomorphic AISR have gradually advanced from having only technical intelligence to cognitive intellect, and eventually to emotional intelligence (Huang and Rust, 2021). For example, Hilton Worldwide has used service robots to support customers (Lu et al., 2019). Further, Japan's Kinosaki Onsen hot spring resort has employed anthropomorphic service robot to

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