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Generational engagement with AI in hospitality: human–AI interaction perspectives across the service process

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ABSTRACT

As artificial intelligence (AI) becomes increasingly integrated into hospitality and tourism operations, it is essential to understand how employees from different generational cohorts engage with AI technologies in the workplace. This conceptual study introduces a generationally responsive framework to examine human AI engagement across three key service phases: pre-arrival, mid-arrival, and post-arrival. It distinguishes between two overarching modes of engagement: interaction, which includes coexistence, cooperation, and collaboration, and collaboration itself, which involves complementarity and augmentation models. Drawing on the Unified Theory of Acceptance and Use of Technology (UTAUT), the framework applies four key dimensions: performance expectancy, effort expectancy, social influence, and facilitating conditions to explain how generational characteristics influence AI perceptions and behaviours. A unique contribution of this study is the identification of an emerging autonomous decision support model, especially relevant for Generation Z, in which AI makes and implements service decisions independently with minimal human involvement. These generational patterns vary across service tasks and reflect broader differences in digital fluency, workplace expectations, and trust in technology. The study concludes that effective AI integration in hospitality requires alignment with the values, preferences, and interaction styles of a multigeneration workforce.

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Artificial intelligence; generational differences; hospitality workforce; human–AI interaction; service process; technology adoption

Introduction

Artificial intelligence (AI) has been rapidly transforming industries worldwide, offering revolutionary ways to enhance efficiency, service delivery, and customer engagement. Defined as the simulation of human intelligence by machines, AI encompasses a variety of technologies, including machine learning, natural language processing, and robotics (Russell & Norvig, 2010). Its rise in popularity is particularly driven by the potential to handle tasks previously limited to human capabilities, such as understanding natural language, learning from experience, and making decisions. In hospitality, the integration of AI has been marked by the growing use of chatbots, automated booking systems, and even AI-powered concierge services. These applications have proven essential in streamlining operations, improving customer experiences, and allowing human workers to focus on more complex, empathy-driven interactions (Cain et al., 2019).

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New Zealand's hospitality and tourism industry is a major contributor to the country's economy, particularly given the allure of its natural landscapes, which draw millions of international tourists each year (Tibay et al., 2018). In 2023, the hospitality industry generated approximately $6.3 billion in GDP, signifying its importance to New Zealand's economic fabric. However, the industry faces enduring structural challenges that hinder its growth, including a tight labour market, high employee turnover, and a heavy reliance on immigrant workers (Hemmington & Neill, 2021). These issues are exacerbated by the fluctuating nature of tourism demand, which often leaves hospitality businesses under-resourced during peak seasons. In this context, the integration of AI presents an opportunity to address some of these labour shortages and operational inefficiencies. New Zealand's hospitality industry has started to adopt AI-driven solutions, such as automated customer service systems and robots delivering in-room services. For example, Christchurch Airport trialled a humanoid robot named 'Pepper' to assist with passenger information, while SkyCity Auckland deployed a service robot at Andy's Burger Bar to deliver meals and interact with guests. These technologies allow businesses to cut down on labour costs while maintaining or even entertaining the guests and enhancing service quality. However, the full potential of AI in the industry remains largely untapped, with most businesses still exploring how to balance technological advancements with the industry's core reliance on personal interaction and human empathy (Wang, 2024).

In addressing the adoption of AI in hospitality, this study distinguishes between three progressive stages of human and AI interaction – coexistence, cooperation, and collaboration. This approach builds on the framework proposed by Reis (2024), extending the interaction spectrum first outlined by Onnasch et al. (2016). Each stage reflects a different depth of engagement between employees and AI systems. Coexistence refers to parallel functioning, where AI operates independently without requiring human involvement. Cooperation involves coordinated activity, where humans and AI perform separate but complementary tasks. Collaboration represents the highest level of integration, where shared goals, mutual adjustment, and ongoing communication define the relationship.

Within the collaboration stage, two models dominate existing hospitality practices. The complementarity model assigns AI to routine and logic-driven functions, allowing human staff to concentrate on emotionally complex or discretionary tasks. The augmentation model enables AI to support human decision-making by providing real-time data analysis and predictive insights, thereby enhancing performance in guest-facing or strategic functions (Li et al., 2021).

This study explores how employees in New Zealand's hospitality industry engage with AI across these stages and models of interaction, and how their preferences vary across three critical service phases: pre-arrival, mid-arrival, and post-arrival. Guided by the Unified Theory of Acceptance and Use of Technology (UTAUT), the study investigates how generational traits influence AI adoption through the dimensions of performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). The research is framed by the following questions:

(1) How are generational traits reflected in the key dimensions of the UTAUT model in the context of AI use in hospitality workplaces?
(2) How are the stages and models of human and AI interaction perceived by different generations through the lens of UTAUT dimensions?
(3) How do generational differences influence hospitality employees' engagement with AI across different service phases?

In addressing these questions, the study responds to the growing need for a more differentiated understanding of AI adoption in frontline hospitality work. Millennials and Generation Z (Gen Z) typically demonstrate greater confidence and enthusiasm towards AI, viewing it as a tool for creativity, efficiency, and personalisation (Alsoud et al., 2023; Schroth, 2019). In contrast, Baby Boomers and Generation X (Gen X) tend to be more cautious, often influenced by concerns about job displacement, lower digital fluency, and strong preferences for traditional service structures (Morris &

Venkatesh, 2000; Nguyen et al., 2021). These differences highlight the necessity of generationally responsive upskilling and inclusive system design to ensure equitable participation in digital transformation efforts (Lovelock & Wirtz, 2016).

The significance of this study lies in the development of an integrated framework that connects generational traits, stages and models of AI interaction, and the specific phases of the hospitality service process. Theoretically, it expands the UTAUT model by embedding it within a task-based understanding of AI engagement across diverse generational profiles. Practically, it offers targeted insights for hospitality managers, human resource professionals, and system designers, enabling them to tailor AI deployment in ways that enhance efficiency without compromising the human focus central to hospitality. In the context of New Zealand's labour-constrained and innovation-driven hospitality industry, these insights are particularly timely and actionable.

Literature review

The development of AI

The evolution of AI has attracted considerable academic and practical interest, progressing from basic rule-based systems to advanced machine learning and deep learning applications. AI combines disciplines including computer science, cognitive science, and psychology, with the aim of replicating human cognitive behaviours such as learning and reasoning. The initial era of AI in the 1950s and 1960s relied heavily on symbolic approaches, where systems followed explicit rules to solve problems. These early systems were limited by their inability to adapt or learn from data, contributing to the 'AI winters' of the 1970s and 1980s, periods where funding and interest declined due to unmet expectations (Weerasooriya, 2023). At that time, research focused on expert systems designed to replicate decision-making in specific contexts; however, they proved ineffective in dynamic environments due to limited adaptability.

AI's revival in the late twentieth century was driven by machine learning, which enabled systems to learn from data without explicit programming (Brynjolfsson & McAfee, 2017). This marked a significant shift towards more flexible, data-driven approaches. Within this framework, subfields such as supervised, unsupervised, and reinforcement learning emerged. Supervised learning, which uses labelled datasets for prediction, is applied in fields such as fraud detection and personalised recommendations. For instance, e-commerce platforms leverage supervised algorithms to analyse customer preferences and improve user experience (Brynjolfsson & McAfee, 2017). Unsupervised learning deals with unlabelled data, uncovering patterns useful for clustering or anomaly detection (IBM, n.d.). Reinforcement learning allows AI agents to learn through interaction, refining strategies based on feedback, as demonstrated by DeepMind's AlphaGo (Brynjolfsson & McAfee, 2017). Deep learning, a subset of machine learning, uses artificial neural networks modelled after the human brain, processing data through multiple layers to recognise complex patterns. This method has been particularly successful in areas such as image and speech recognition (Pain, 2023). By analysing vast datasets, deep learning models can achieve high accuracy, thus expanding AI's capabilities and applications.

AI has been applied across various industries, significantly enhancing efficiency and personalisation. In the hospitality industry, AI manages routine tasks such as handling customer queries and managing bookings, streamlining operations and improving response times (Nozawa et al., 2022; Wang, 2024). Similarly, in healthcare, AI systems enable early and accurate disease diagnoses, often surpassing traditional methods in speed and precision, transforming patient care and treatment outcomes (Can, 2021). The retail industry has also embraced AI, with recommendation engines analysing customer behaviour to offer personalised product suggestions, boosting overall satisfaction and engagement. While the integration of AI requires investment in training and maintaining algorithmic transparency, its evolution from symbolic reasoning to machine learning has highlighted its transformative impact across sectors, underscoring its growing influence and the

potential for future advancements (Kılıçhan & Yılmaz, 2020; Li, 2023; Wei & Attila, 2023). AI's adoption continues to shape industries, demonstrating its capability to revolutionise traditional practices through data-driven insights and automation.

The application of AI in the hospitality industry of New Zealand

The application of AI in New Zealand's hospitality industry is increasingly recognised as a transformative solution to several longstanding challenges. As a crucial contributor to the country's economy, the hospitality industry is confronted by labour shortages, high turnover rates, and competition from other industries (Hemmington & Neill, 2021; Tibay et al., 2018). These issues are compounded by the perception of hospitality jobs as undesirable, offering low wages, irregular shifts, and limited career progression. In particular, the COVID-19 pandemic further exacerbated these challenges by causing widespread layoffs and workforce departures, pushing the industry to adopt innovative approaches to mitigate these issues and restore growth (Akintola et al., 2022). AI technology has emerged as a promising tool that can improve operational efficiency, streamline service delivery, and address workforce challenges, especially in a post-pandemic context.

One of the key applications of AI in the hospitality industry is its ability to analyse large datasets, offering insights into customer preferences, operational performance, and market trends (Kong et al., 2022; Manigandan & Raghuram, 2022). By processing vast amounts of data, AI supports data-driven decisions that enhance service quality, personalise experiences, and increase profitability. For example, AI tools used in the pre-arrival phase of hospitality services optimise reservations by predicting demand, adjusting prices dynamically, and analysing travel patterns (Gündüz, 2023). Chatbots now provide 24/7 support, handling routine queries and allowing staff to focus on more complex, personalised tasks. During a guest's stay, AI automates functions such as check-ins, concierge, and delivery services traditionally performed by humans. This reduces staff burden and allows employees to focus on meaningful, customer-facing roles, thereby improving both service and morale (Nam et al., 2020). After departure, AI analyses customer feedback and behaviour to inform pricing, promotions, and targeted marketing strategies (Drexler & Lapré, 2019; Zhang & Jin, 2023). These capabilities support long-term loyalty by enabling tailored customer engagement based on data-driven insights.

In New Zealand, the hospitality industry has long relied on immigrant labour, particularly from Asia, resulting in a diverse but often low-skilled workforce (Lugosi & Ndiuini, 2022). The industry tends to prioritise experience over formal qualifications, and the lack of structured training contributes to persistent skill gaps. High turnover further discourages investment in staff development (Nguyen et al., 2021). AI offers a potential solution by automating low-skill tasks and supporting on-the-job learning, helping businesses maintain service quality while reducing dependence on low-skilled labour. As AI becomes more integrated into operations, the focus is shifting from automation to how humans and AI collaborate in practice. This evolving relationship is reshaping service delivery and workforce roles in the hospitality industry. Huang and Rust (2018, 2021) propose that AI evolves through four levels of intelligence – mechanical, analytical, intuitive, and empathetic – each capable of managing increasingly complex service tasks. While AI initially supports routine functions, it may eventually replace entire roles as its cognitive and emotional capacities grow. Building on this, Reis (2024) introduces a three-level model of human–AI relationships, with collaboration and integration forming the most common and practical approaches in hospitality today.

Interaction patterns between AI and humans

Recent frameworks in human–AI relationships conceptualise AI engagement through varying levels of interaction intensity. Reis (2024), building on the foundational taxonomy by Onnasch et al. (2016) and Schmidtler et al. (2015), outlines three distinct forms of human–robot interaction – coexistence, cooperation, and collaboration – which serve as increasing stages of operational complexity and

interdependence between humans and artificial agents. These interaction models provide a precise lens for understanding how AI technologies are introduced, utilised, and embedded within hospitality service environments.

According to Reis (2024), at the most basic level, coexistence refers to situations where humans and AI systems share the same workspace and time domain but operate independently. There is no direct goal alignment or interaction between the two; rather, their co-location is managed to avoid conflict or interference. An example in hospitality includes service robots that clean corridors or transport luggage without engaging with staff or guests. This low-level interaction primarily optimises spatial efficiency and safety rather than operational synergy. The next level, cooperation, entails a shared aim between humans and AI agents but without real-time interaction. Tasks are typically divided, with each actor working in parallel or sequence towards a mutual outcome. For example, an AI system might handle initial guest bookings or generate standardised itineraries, which human staff later review and customise. This mode supports increased efficiency while maintaining human oversight and control, especially in routine or rule-based activities.

The most advanced and integrated form of interaction is collaboration, where humans and AI systems dynamically exchange information and adjust actions in real-time, requiring shared goals, common workspace, and direct interaction. Collaboration often involves adaptive systems interpreting human inputs and modifying responses accordingly. In hospitality, front desk staff working alongside AI-powered concierge systems exemplify collaboration, adapting service suggestions based on guest profiles and live feedback. Collaboration, as Reis (2024) explains, represents Level 2 in the broader human–AI relationship hierarchy, where AI systems begin assuming selective functions within a shared task environment while maintaining human presence for context-sensitive decision-making and social interaction.

Within the collaboration stage, two main patterns of human–AI collaboration have emerged: complementarity and augmentation. The complementarity model, discussed by Manigandan and Raghuram (2022), emphasises the supportive role of AI in automating repetitive and structured tasks, freeing human workers for more nuanced responsibilities. AI excels in tasks such as data entry, room assignments, and routine inquiries, significantly reducing human error and increasing efficiency (Nam et al., 2020). For instance, AI systems managing room allocations based on guest preferences allow human staff to offer personalised recommendations and services (Ananeva, 2019; Ivanov, 2019). Conversely, the augmentation model enhances human decision-making through AI's analytical capabilities. AI analyses customer data, booking histories, and preferences, enabling human staff to anticipate guest needs and tailor services with greater precision (Drexler & Lapré, 2019; Parvez, 2022). Rather than replacing human tasks, this model empowers employees through enhanced data analysis and real-time feedback, fostering a stronger human–AI partnership.

Despite the clear benefits, challenges persist in human–AI collaboration. Data privacy concerns, ethical considerations, employment impacts, and the practical usability of AI systems remain significant issues. AI-driven automation can exacerbate job displacement fears and contribute to high turnover rates, shifting workforce expectations towards roles that demand emotional intelligence and interpersonal skills (Goralski & Tan, 2020; Khoa et al., 2022; Manigandan & Raghuram, 2022; Zhang & Jin, 2023). Practical training, intuitive design, and clear ethical guidelines are essential to address these challenges, ensure secure data handling, and foster employee trust in AI systems (Gáll, 2023; Huang et al., 2024; Jiang et al., 2021; Khoa et al., 2022; Kim et al., 2024; Wang, 2024).

Generations in the hospitality workforce

To better understand how different generations approach AI and technology in the hospitality workplace, it is useful to examine the distinct characteristics of each generational cohort – Baby Boomers, Gen X, Millennials, and Gen Z. These groups vary significantly in their

values, work styles, and familiarity with digital technologies, all of which influence their readiness to engage with AI systems.

Baby Boomers (1946–1964)

Baby Boomers grew up in a world largely devoid of digital technologies, and many entered the workforce before the widespread use of computers (Lanier, 2017). As a result, their approach to work is often characterised by a preference for personal interaction, hierarchical structures, and traditional methods of communication (Smola et al., 2002). Baby Boomers are known for their strong work ethic and loyalty to employers, often viewing work as a central part of their identity. However, when it comes to technology, Baby Boomers are typically slower to adopt new tools, including AI (Bolser & Gosciej, 2015). Research suggests that Baby Boomers may perceive technology as a disruption to established work practices and may struggle with adapting to rapid digital changes (Charness & Boot, 2009). Consequently, they may be more resistant to AI adoption due to concerns about job displacement and a lack of confidence in using complex digital systems (Venkatesh et al., 2012). Overcoming this resistance often requires targeted training and communication strategies that emphasise AI's supportive role in enhancing, rather than replacing human jobs.

In New Zealand, Baby Boomers' interactions with AI and emerging technologies reflect many of the generational traits observed globally, but also exhibit characteristics shaped by the local context. Many hold a deep appreciation for face-to-face interaction and community values, shaped by decades of working in environments that prioritised strong interpersonal relationships and collaborative, hands-on work methods. Their preference for traditional forms of communication and structured work practices often clashes with the rapid digital advancements taking place in the workplace, particularly in the hospitality industry (Wang, 2024). Despite New Zealand's increasing push towards digitalisation – including the adoption of AI-driven solutions for customer service and operational efficiency – Kiwi Baby Boomers often approach these shifts with caution and, at times, skepticism. Research shows that while 40% of New Zealand seniors have become more tech-savvy since the COVID-19 pandemic, 50% still feel left behind by modern technology, and 69% express concerns about safety and security (New Zealand Seniors, 2022). According to a study of 1600 Kiwi workers conducted by *The New Zealand Herald* (Keall, 2024), many Baby Boomers are interested in retraining for AI-related roles, and employers indicate a willingness to offer higher pay to those who do. However, this interest is often tempered by fears about job security and a lack of confidence in navigating digital systems.

Generation X (1965–1980)

Gen X workers entered the workforce during the personal computing revolution and are often described as 'digital immigrants' (Prensky, 2001). While not as digitally fluent as younger cohorts, they are generally more comfortable with technology than Baby Boomers and tend to value independence, flexibility, and efficiency in the workplace (Bolser & Gosciej, 2015; Eisner, 2005). Although they may not be as enthusiastic about AI as younger generations, they are open to innovations that clearly enhance productivity and streamline tasks (Hershatter & Epstein, 2010). Targeted training that focuses on practical, task-specific applications can increase engagement and reduce hesitation towards AI adoption.

Kiwi Gen X workers demonstrate a distinctive approach to adopting technology, shaped by their formative experiences during the personal computing revolution. This cohort values independence, flexibility, and efficiency in their professional lives, often seeking a balance between work and personal commitments. As noted by Reece Notton, an Auckland-based human resources consultant, Gen X individuals are ambitious and driven but also prioritise work-life balance and are likely to move on if their career expectations are not met (NZ Herald, 2000). Their pragmatic nature leads them to embrace technological innovations that demonstrably enhance productivity and streamline tasks. However, they may exhibit caution towards AI integration if it necessitates significant changes to established workflows or lacks clear, practical benefits. The New Zealand Productivity Commission

(2020) highlights that while Gen X is generally open to technological advancements, successful AI adoption within this group requires solutions that integrate seamlessly into existing processes and offer tangible improvements in efficiency.

Millennials (1981–1996)

Millennials, often described as 'digital natives', are the first generation to grow up fully immersed in the internet and mobile technologies (Bolton et al., 2013). They tend to be early adopters of digital tools, including AI, and value technology for its ability to improve efficiency and drive innovation (Bennett et al., 2008). Known for seeking meaningful work, flexibility, and collaboration, Millennials expect access to advanced technologies in the workplace (Myers & Sadaghiani, 2010). They are more likely to be comfortable using AI for both routine and complex tasks and view it as a means to automate repetitive processes, enabling more focus on creative or strategic work (Ertas, 2015; Ng et al., 2010). For this cohort, the key challenge is not adoption but ensuring that AI enhances the quality and purpose of their work (Kowske et al., 2010).

Kiwi Millennials bring a forward-thinking mindset to human and AI interaction. They seek roles that align with personal values and offer a healthy balance between career and life (Barker, 2019). Their approach to AI is practical and intentional, aimed at using technology to foster collaboration and innovation. While they recognise AI's transformative potential, they are committed to ensuring it supports positive workplace cultures and contributes to personal and professional growth.

Generation Z (1997–2013)

Gen Z, the youngest cohort in the workforce, has grown up with smartphones, social media, and AI-based applications as part of everyday life (Prensky, 2001). Extremely comfortable with technology, they expect digital tools, including AI, to be standard in the workplace (Schroth, 2019). This generation embraces AI with minimal hesitation, viewing it as a natural extension of familiar technologies like voice assistants and recommendation algorithms (Seemiller & Grace, 2016). They value innovation, efficiency, and real-time feedback, but also express concern about AI's ethical implications, including data privacy and job displacement (Schroth, 2019). Gen Z's adaptability and capacity for rapid learning position them to lead in the evolving digital workplace, provided that AI aligns with their ethical expectations and supports positive social outcomes.

In New Zealand, Gen Z approaches human and AI interaction with both optimism and pragmatism, shaped by deep immersion in digital culture. They expect automation to streamline workflows and create space for more creative or meaningful contributions. Many participate in the gig economy, supplementing traditional employment with flexible income streams (Barker, 2019). Flexibility and ongoing learning are central values, as they recognise the need to adapt to fast-changing technologies. While many do not foresee radical changes to their jobs in the near future, they are aware of the importance of soft skills such as creativity and resilience. As they enter the workforce in greater numbers, New Zealand's Gen Z employees are likely to play a key role in shaping workplace innovation while advocating for ethical, human centred applications of AI.

Conceptualisation of research framework

This study develops a conceptual framework to examine how hospitality employees from different generational cohorts engage with AI across service delivery phases. The framework is structured around three interrelated dimensions: (1) age-based workforce segmentation (Baby Boomers, Gen X, Millennials, and Gen Z), (2) the nature of the human–AI interaction, and (3) the phases of the service process (pre-arrival, mid-arrival, and post-arrival).

The theoretical foundation for age-related segmentation draws on Morris and Venkatesh's (2000) model, which highlights how age influences technology adoption through perceived usefulness, ease of use, and social norms. This is expanded in the UTAUT framework developed by Venkatesh

et al. (2003), which identifies four core determinants of technology acceptance: performance expectancy, effort expectancy, social influence, and facilitating conditions. Since these factors are moderated by age and experience, UTAUT is particularly suited for examining generational differences in the hospitality workforce. For instance, younger employees often report higher expectations for performance and ease of use, while older cohorts may place greater emphasis on support and peer influence when engaging with AI tools. Although these frameworks are theoretically relevant, empirical research focusing on generational cohorts within the New Zealand hospitality context remains limited. To address this, Table 1 synthesises insights from secondary sources and existing literature, mapping generational traits against the UTAUT dimensions as a basis for future model development.

The generationally responsive framework in Figure 1 is based on Reis's (2024) three-level model of human and AI relationships, applied to the hospitality service process across pre-arrival, mid-arrival, and post-arrival phases (Lovelock & Wirtz, 2016). It incorporates the four dimensions of the UTAUT model: perceived usefulness, ease of use, social influence, and organisational support. These dimensions help explain how different generational cohorts engage with AI at each stage. Variations in task complexity, cognitive effort, and emotional demands across the service phases interact with generational characteristics and digital familiarity, shaping preferences for either collaborative or integrative use of AI. Figure 1 presents three types of interaction between humans and AI: coexistence, cooperation, and collaboration, adapted from Onnasch et al. (2016). Each type reflects either a complementarity or augmentation approach offering a structured perspective for aligning AI implementation with workforce needs and service goals.

For Baby Boomers, interaction with AI follows a staged progression beginning with coexistence in the pre-arrival phase. They prefer AI systems that operate independently in the background, such as automated booking engines or robotic cleaning systems, which do not interfere with their interpersonal style of guest engagement (Bolser & Gosciej, 2015; Smola et al., 2002). During the mid-arrival phase, they move towards cooperation, allowing AI to assist with structured, rule-based processes like check-ins or notifications, while they manage exceptions and maintain control over personal interactions. In the post-arrival phase, Baby Boomers engage in collaboration, specifically through a complementarity model. AI systems may generate performance feedback or automate follow-up communications, but the human role remains central in loyalty management and resolving complex guest concerns. This cautious yet evolving interaction reflects their skeptical view of AI's usefulness, challenges with digital interfaces, and reliance on strong organisational support (Charness & Boot, 2009; Keall, 2024; New Zealand Seniors, 2022).

Gen X begins with cooperation in the pre-arrival phase, using AI for data collection and guest segmentation while retaining authority over final decision-making. This preference for structured systems continues into the mid-arrival phase, where cooperation remains dominant. AI performs operational tasks – like itinerary generation or service tracking – while human employees monitor workflows and step in when context-specific judgement is required (Nam et al., 2020). In the post-arrival phase, Gen X transitions into collaboration, specifically under the complementarity model. AI provides data insights and operational efficiency, but humans retain control over guest feedback, complaint resolution, and relationship continuity. This structure matches their pragmatic performance expectations, cautious effort orientation, and preference for individual control within clearly defined systems.

Table 1. Generational traits in UTAUT dimensions.

Generation	Performance expectancy	Effort expectancy	Social influence	Facilitating conditions
Baby Boomers	Skeptical	Challenged	Traditional	Dependent
Gen X	Pragmatic	Cautious	Individualist	Structured
Millennials	Optimistic	Confident	Collaborative	Resourceful
Gen Z	Expectant	Fluent	Networked	Autonomous

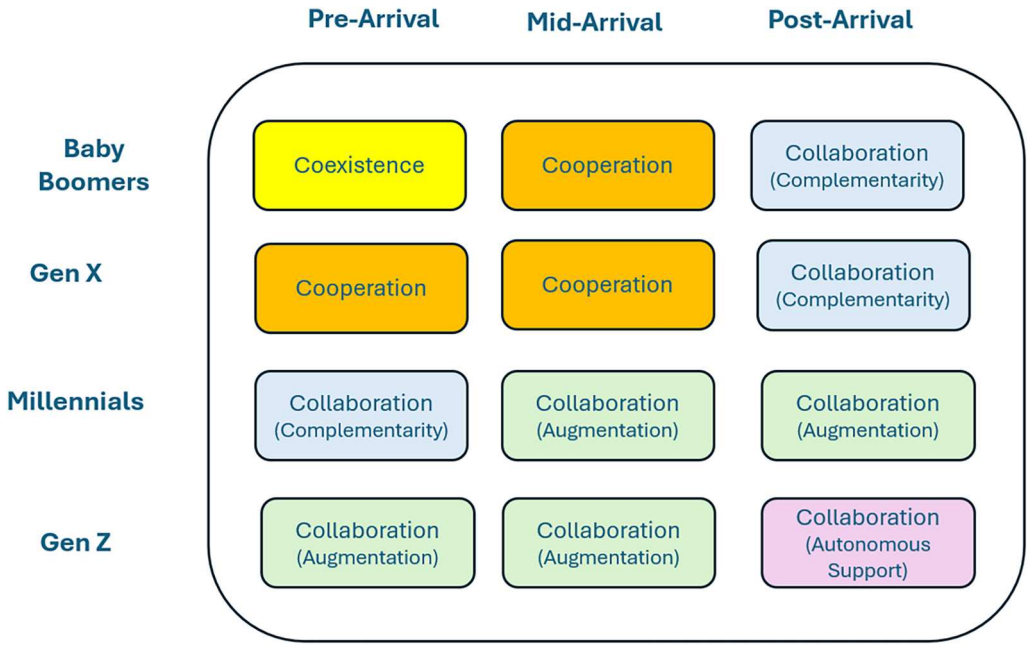

Figure 1. Human–AI engagement models and generations.

Millennials display a more integrated engagement across phases. In the pre-arrival stage, they begin with collaboration through the complementarity model, using AI for demand forecasting and digital marketing automation while contributing to messaging and service refinement. As digital natives, they smoothly shift into collaboration under the augmentation model during mid-arrival, relying on AI to generate real-time guest insights and service enhancements while still managing experience curation and social interactions (Myers & Sadaghiani, 2010). By the post-arrival phase, Millennials continue this augmentation model, working alongside AI to tailor follow-up communications, personalise loyalty offers, and drive innovation in guest engagement (Bolton et al., 2013; Ng et al., 2010). Their optimistic outlook, confidence with technology, and collaborative orientation support this seamless integration of AI throughout the service process.

Gen Z consistently demonstrates the highest level of interaction – collaboration – across all service phases. In the pre-arrival phase, they use AI tools autonomously for pricing, forecasting, and personalised messaging. During mid-arrival, they apply AI systems to co-create service experiences in real time, interacting with platforms that automate guest communications, anticipate preferences, and adapt dynamically. In the post-arrival phase, their collaboration reaches a new threshold: autonomous decision support. AI systems do not merely augment human capabilities but begin to proactively make service decisions – such as follow-up timing, targeted promotions, or feedback loops – based on predictive analytics and behavioural learning. Gen Z staff are comfortable trusting these systems due to their fluency and trust with digital tools, high performance expectations, and autonomous learning styles (Schroth, 2019; Seemiller & Grace, 2016). They prefer systems that reduce managerial oversight and allow for agile, data-driven execution, reinforcing their identity as independent and digitally empowered workers.

Implications and future research

This study contributes to the growing literature on human and AI relationships by integrating generational work behaviour theory with the hospitality service process. It distinguishes between three

interaction stages – coexistence, cooperation, and collaboration – and introduces embedded collaboration models, namely complementarity, augmentation, and concluded an emerging model termed autonomous decision support. Drawing on Reis's (2024) extension of Onnasch et al. (2016), this framework positions collaboration as a specific form of interaction rather than a synonym for it. It advances the field by mapping both interaction stages and collaboration models across the three service phases of pre-arrival, mid-arrival, and post-arrival, offering a more generationally responsive approach to AI integration in hospitality work systems.

Rather than conceptualising AI as a static solution, this study presents it as a flexible system shaped by generational preferences and operational contexts. Baby Boomers progress from coexistence to cooperation and eventually to collaboration through a complementarity model, favouring AI tools that operate discreetly or support their roles without displacing their relational style of service. Gen X prefers structured cooperation in earlier phases and moves towards complementarity-based collaboration when systems can be predictably integrated into their workflows. Millennials demonstrate a fluid adoption of collaboration, evolving from complementarity into augmentation as their digital confidence enables more engaged use of AI tools. Gen Z, by contrast, engages in collaboration from the outset.

A key contribution of this study is the introduction of a new model within the collaboration stage: autonomous decision support. This model captures a distinctive pattern among Gen Z, where AI systems do not merely assist human staff but independently initiate decisions related to service delivery, follow-ups, and personalised guest interaction. These systems leverage predictive analytics and real-time data to act proactively, often with minimal human oversight. The autonomous decision support model signals a future-facing shift in human–AI collaboration, raising new questions around accountability, trust, and co-agency in hospitality settings.

These generational patterns expand foundational technology adoption theories (Morris & Venkatesh, 2000; Venkatesh et al., 2003), which traditionally focus on performance expectancy and effort expectancy, by incorporating trust, autonomy, and identity-based preferences. By structuring interaction and collaboration as layered constructs and identifying a new advanced model within collaboration, this study provides a more detailed framework for understanding AI adoption in the hospitality industry. It encourages future research to empirically examine the fit between generational workstyles and AI system roles, highlighting that effective AI integration is as much about behavioural alignment as it is about technical readiness.

The generational framework offers clear guidance for hospitality leaders, HR managers, technology developers, and educators by aligning AI strategies with generational work traits. Rather than applying a single approach, organisations should tailor AI implementation to workforce profiles and task types. For Baby Boomers and Gen X, AI should function as a support tool for backend tasks like bookings or data analysis, with training that builds digital trust. In contrast, Millennials and Gen Z prefer direct interaction with AI and can co-design systems for personalisation, automation, and real-time engagement. The model also reframes how AI and human roles should be distributed in service design. Rather than replacing staff, AI should complement human strengths. Tasks with limited emotional complexity may suit low-level interaction, while dynamic services require collaborative AI support. This structured approach helps managers allocate AI tools across service stages without compromising hospitality values. For workforce development, the framework underscores the need for generationally appropriate upskilling. Older workers require confidence-building training in basic AI use, while younger workers benefit from advanced training in analytics, ethics, and AI design. Aligning AI tools with generational expectations – such as stability, innovation, or autonomy – can ease adoption and support inclusive transitions.

Although the study introduces a novel framework linking generational traits to AI engagement, it is conceptual and based on secondary literature. Future research should test the framework using qualitative or quantitative data. The New Zealand context may not generalise globally, so cross-cultural research is needed to examine different models in diverse hospitality environments. Longitudinal studies could also track how generational attitudes evolve as AI becomes more embedded in

daily tasks. Further studies may explore how emotional labour, task complexity, and organisational culture influence AI engagement across generations. While this study focuses on employees, guest perspectives should be included in future work. Ethical issues such as transparency, bias, and digital inclusion need more attention. Research should investigate how AI impacts workforce equity, especially for workers with limited digital skills, and how policy and training can promote fair and sustainable AI adoption in hospitality.

Conclusion

This study argues that the future of hospitality work will not be defined by whether AI replaces humans, but by how intelligently AI is embedded within the diverse realities of a multigenerational workforce. By introducing a framework that maps generational preferences to different models of AI interaction across the service process, this research provides not only a conceptual tool, but a practical roadmap for organisations navigating digital transformation.

AI should not be treated as a universal solution. Its effectiveness depends on how well it aligns with employee characteristics, task demands, and organisational culture. In a field built on empathy, discretion, and personal connection, ignoring generational differences in how people work with AI risks weakening both staff engagement and guest experience. A unique contribution of this study is the identification of a new model of autonomous decision support, which is especially relevant among Gen Z. In this model, AI independently carries out service decisions using real-time data and predictive analysis, with minimal human oversight. Although this model promises greater efficiency, it also introduces new concerns around ethics, control, and transparency. As AI systems evolve, hospitality organisations will need clear policies and design strategies that ensure these technologies enhance rather than replace human judgment and responsibility. The long-term success of AI in hospitality will depend on valuing people across all generations as essential partners in delivering intelligent and quality service. Looking ahead, Generation Alpha, who will enter the workforce as fully digital natives, may challenge existing models even further, requiring more adaptive, ethical, and inclusive approaches to AI use in hospitality.

Author contributions

CRediT: **Pola Q. Wang:** Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing; **Liwei Yan:** Investigation; **Carolin Santoso:** Data curation.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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