

The Artificial Intelligence Enabled Customer Experience in Tourism: A Systematic Literature Review

Abstract

Purpose: The increased utilisation of artificial intelligence enabled applications (AI-ETs) across the customer journey has transformed customer experience (CX), introducing entirely new forms of the concept. This paper aims to explore existing academic research on the AI-enabled customer experience (AICX), identifying gaps in literature and opportunities for future research in this domain.

Approach: A systematic literature review (SLR) was conducted in March 2022. Using 16 different keyword combinations, literature search was carried across 5 databases where 98 articles were included and analysed. Descriptive analysis that made use of the Theory, Characteristics, Context, Methods (TCCM) framework was followed by content analysis.

Findings: The study provides an overview of available literature on the AICX, develops a typology for classifying the identified AI-ETs, identifies gaps in literature, and puts forward opportunities for future research under 5 key emerging themes: 1. Definition and dynamics, 2. Implementation, 3. Outcomes and measurement, 4. Consumer perspectives, 5. Contextual lenses.

Originality: The study establishes a fresh perspective on the interplay between AI and CX, introducing the AICX as a novel form of the experience construct. It also presents the AI-ETs as an integrated and holistic unit capturing the full range of AI technologies. Remarkably, it

represents a pioneering review exclusively concentrating on the customer-facing dimension of AI applications.

Keywords: Customer Experience (CX), Artificial Intelligence (AI), AI-enabled Customer Experience (AICX), AI-enabled Technologies (AI-ETs), Tourism, Systematic Review, TCCM Framework

Tourism Review

1. Introduction

Customer experience (CX) is a key aspect of the service encounter, encompassing various reactions of customers to a market offering (Lemon and Verhoef, 2016). While debates are surrounding the definition and nature of CX (see Becker and Jaakkola, 2020; Brakus *et al.*, 2009; Lemon and Verhoef, 2016; Verhoef *et al.*, 2009), one area of closer consensus is the impact of technology on the experience (Hoyer *et al.*, 2020). Increased personalization, customer involvement, and co-creation enhance opportunities for customer-technology interactions through emerging touchpoints and encounters. This, in turn, presents formidable challenges in comprehending and effectively managing CX, considering the elevated expectations of customers towards flawless experiences. The integration of AI is expected to enhance these effects and introduce a new concept known as AI-enabled Customer Experience (AICX) (Buhalis *et al.*, 2019; Hoyer *et al.*, 2020). AICX refers to customers' cognitive, emotional, behavioural, sensorial, and social responses to the integration of AI-enabled technologies into service encounters throughout the customer journey. It addresses the CX construct through the AI lens and therefore focuses on the impact of AI technologies in shaping and enhancing the overall experience.

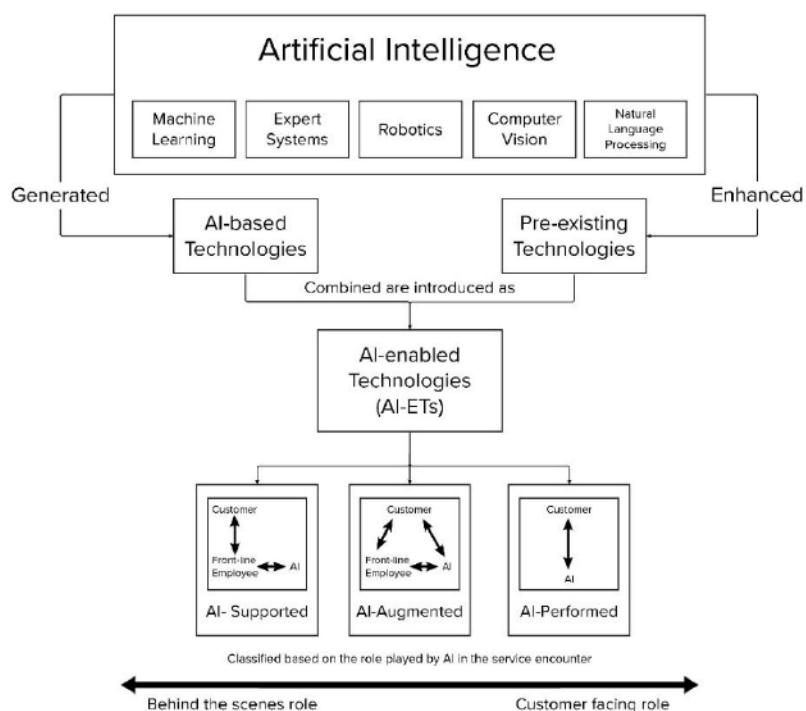
AI is defined as machines' ability to mimic cognitive functions associated with human intelligence (Winston and Prendergast, 1984). It stands out as a transformative force, generating novel AI-based applications and revolutionizing other pre-existing technologies (Bulchand-Gidumal *et al.*, 2023). To capture this broad range, the term "Artificial Intelligence Enabled Technologies" (AI-ETs) is used in this study. Current AI-ETs draw upon several overlapping subfields, methods, and techniques that are expected to continue

expanding both in depth and breadth (see Figure 1). These AI-ETs, however, can be allocated on a spectrum ranging from behind the scenes like personalized recommendations and demand forecasting, to customer-facing AI like virtual reality travel experiences, virtual assistants, and chatbots (Ostrom *et al.*, 2019). This study focuses on customer-facing AI that visibly impacts the CX and enhances the experiential aspect of the customer journey (Tussyadiah *et al.*, 2018). Managerial-focused AI implementations and AI playing a supporting role in the service encounter are beyond the scope of this study.

With an increased reliance on AI-ETs and the role it plays in reshaping experiences (Goel *et al.*, 2022), understanding the impact of AI integration and the resulting AICX emerged as a top priority for academic researchers and marketing professionals alike (Verma *et al.*, 2021). The advancements of AI, customers' expectations, and ethical concerns about its implementation, to name a few, are collectively contributing to this prioritization (Ameen *et al.*, 2021; Jabeen *et al.*, 2022). Available literature, however, is rather limited and fails to adequately consider the experiential aspects of AI integration. Drawing on the valuable insights of Buhalis *et al.* (2019) regarding technological disruptions in services and building upon the assertions of Hoyer *et al.* (2020) that AI advancements will bring about a paradigm shift and redefine the CX, this research intends to fill this gap by introducing a systematic literature review (SLR) that explores academic research on customer-facing AI-ETs and CX in tourism. The literature pertaining to AICX in tourism, specifically customer-facing AI-ETs, has not been thoroughly explored. Therefore, this study seeks to identify knowledge gaps, direct future research, and thereby contribute to the theoretical understanding of the CX.

The tourism sector is chosen as the context for studying AICX due to its experiential nature, wide adoption of customer-facing AI-ETs, economic importance, and diverse customer base. From hotel guests interacting with intelligent voice assistants for room service and museum visitors using augmented reality for tours, to restaurant customers being served by robots, a range of compelling examples demonstrates the potential of AICX in tourism (Buhalis and Moldavska, 2022; Fusté-Forné, 2021; Ivanov *et al.*, 2023; Trunfio and Campana, 2020).

The paper is structured as follows. The next section outlines the research approach adopted. This is followed by descriptive analysis for the retrieved articles using the Theory, Characteristics, Context, Methods (TCCM) framework (Rowley and Paul, 2021). The AI-ETs cube framework for categorising the AI-ETs is then presented. The subsequent section introduces the identified gaps in knowledge. The paper concludes with implications and limitations of the study.



2. Research Approach

A SLR is a replicable, transparent, and rigorous scientific approach to identify, analyse, and synthesise available literature on a given topic (Jones and Gatrell, 2014; Paul *et al.*, 2021).

Considering the objective of this study, the systematic quantitative review method is deemed as the most suitable approach (Pickering and Byrne, 2014). This study therefore closely aligns with the well-established approach introduced by Yang *et al.* (2017), which is specifically designed for quantitative systematic reviews in social sciences. The approach has been widely cited and adopted in previous SLRs focusing on the intersection of tourism and technology (Khoo-Lattimore *et al.*, 2019; Shafiee *et al.*, 2021; Yung and Khoo-Lattimore, 2019). To enhance the quality of reporting and transparency, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework is also adopted (Page *et al.*, 2021) (see Figure 2).

The research objective of exploring AICX in the context of tourism shaped the selection of keywords, databases, quality threshold, and inclusion/exclusion criteria, thus influencing the approach to conducting the SLR. Accordingly, sixteen keywords from three domains retrieved from previously published SLRs or identified during scoping searches were used (**AI**: Artificial Intelligence, Intelligent Technolo*, Smart, Robot*, Humanoid, Chatbot*, Automation, Augmented Reality, Virtual Reality, Mixed Reality, Virtual Assistants, **CX**: Tourist Experience, Customer Experience, Visitor Experience, **Tourism**: Touri*, Trave*). Further, to ensure comprehensibility, five widely used databases (EBSCOHost, Emerald, Web-of-Science, ScienceDirect, and ProQuest) were selected. The search query included one keyword from each domain where the keywords were separated by the Boolean phrase

"AND". Wherever applicable, one comprehensive search query was used for all the AI domain keywords while separated by the Boolean phrase "OR". Database search took place in June 2021; subsequently, an update search was carried out in March 2022 to ensure that results are current and obtain any new information that may have become available.

Six criteria were chosen for the inclusion/exclusion process: (1) English language; (2) Availability in an electronic format; (3) Inclusion of specific search keywords in title/abstract/keywords; (4) Focus on CX with a technological lens involving a customer-facing AI application; (5) Tourism or hospitality journal or clear tourism context in study; (6) Use of Association of Business Schools Academic Journal Guide (CABS AJG) as quality threshold. Through the application of these criteria, articles that were not related to technology or the tourism context, focused on non-customer facing AI-ETs, or provided only brief discussions on CX and AI were excluded. As a result, a total of 98 articles remained for further analysis. The study employed descriptive analysis, leveraging quantitative data to provide a structured and comprehensive overview based on the TCCM framework (Paul *et al.*, 2021). In addition, content analysis introduced the AI-ETs Cube and valuable insights concerning the identified gaps found in the literature. The following sections present an overview of the outcomes.

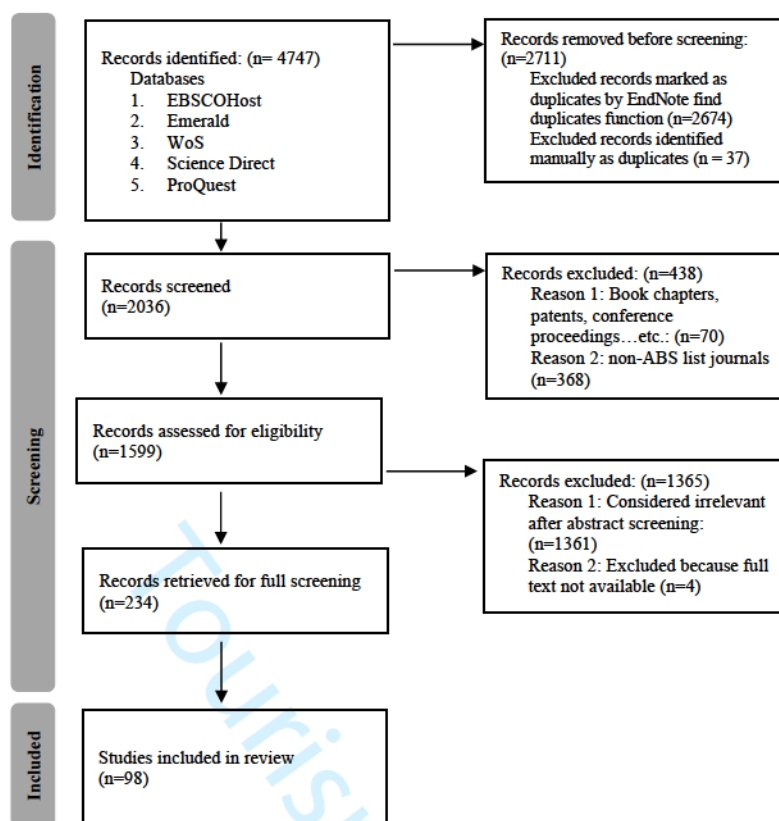


Figure 2: PRISMA flowchart

3. Descriptive Overview

The following sections utilizes the TCCM framework (Paul and Criado, 2020; Thomas and Gupta, 2022) to present the descriptive findings.

3.1. Theories

Eighty-one theories and models were identified from various fields, including information systems (IS), psychology, consumer behaviour, sociology, economics, marketing, and management. This study classified the identified theories based on the aim of the study, utilizing the theory, which resulted in five main clusters: Acceptance and Adoption,

Evaluation, Marketing and Advertising, Organizational Perspective, and Consumer Behaviour. Table I illustrates these five clusters and provides examples from retrieved literature.

[Table I here]

3.2. Characteristics

The 98 articles included in this review were published in 29 different academic journals (See Table II). Most articles were published in tourism and hospitality journals, with the remainder in services, business, and management journals. Figure 3 shows that all the included articles in the SLR are published after 2011, corresponding with the introduction of AI into the sector, with the number increasing year on year.

[Table II here]

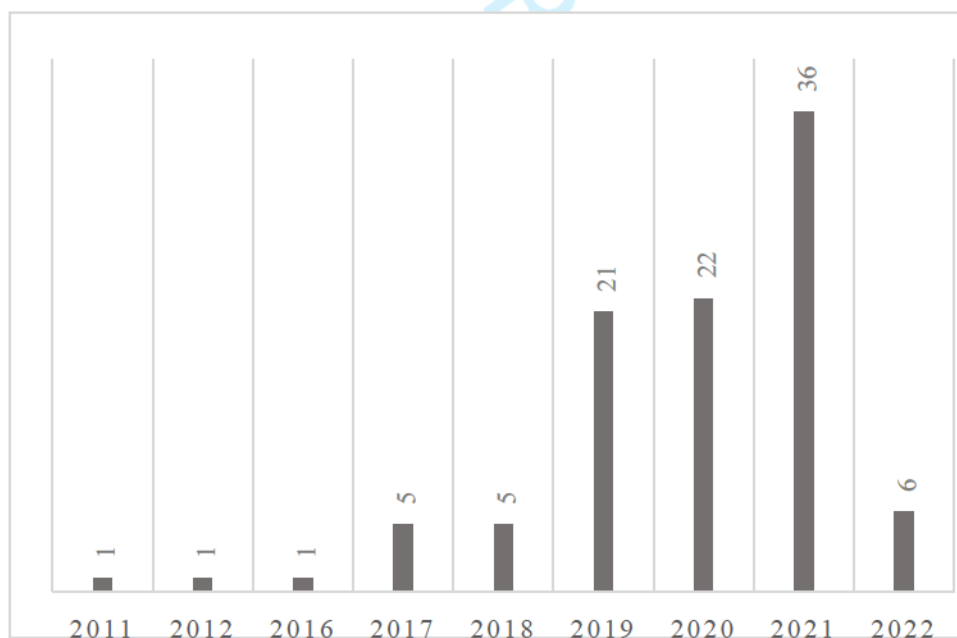


Figure 3: Distribution of articles by year

3.3. Context

The intersection between tourism and technology provides two different viewpoints to look at the context of retrieved articles. From a technological standpoint, the key identified AI-ETs were: service robots (e.g. Ma *et al.*, 2021), intelligent voice assistants (IVAs) (e.g. Loureiro *et al.*, 2021), chatbots (e.g. Pillai and Sivathanu, 2020), AR (e.g. Tom Dieck *et al.*, 2018), VR (e.g. Lee *et al.*, 2020), and mixed reality (MR) (e.g. Trunfio *et al.*, 2020). Literature on VR, AR, and service robots is more developed than that for IVAs, chatbots, and MR, which is still in the infancy stage. Categorizing at a higher technical level or in relation to specific service tasks is beyond the scope of this review.

From a sectoral standpoint, studies commonly focus on hotels (e.g. Shin and Jeong, 2020), restaurants (e.g. Kim *et al.*, 2021), and museums (e.g. Serravalle *et al.*, 2019). Additionally, research extends to festivals (e.g. Tom Dieck *et al.*, 2018), events (e.g. Neuhofer *et al.*, 2021), religious destinations (e.g. Allal-Chérif, 2022), cruises (e.g. Simoni *et al.*, 2022), cultural heritage sites (e.g. Jung *et al.*, 2018), art galleries (e.g. Han *et al.*, 2019), and theme parks (e.g. Milman *et al.*, 2020). Other studies address the sector holistically

3.4. Methods

Both empirical work (n=75) and conceptual/review papers (n=23) were identified (see Figure 4). Empirical studies employed a variety of quantitative (n=43), qualitative (n=26), and mixed-method (n=6) designs. Surveys (quantitative) and semi-structured interviews (qualitative) were common methods used, with technology playing a role in data collection techniques. Examples include: online surveys (e.g. Milman *et al.*, 2020), technology-enabled

experimental designs (e.g. Lyu *et al.*, 2021), user-generated content on social media (e.g. Çakar and Aykol, 2021), and video-enhanced scenarios (e.g. Paulo *et al.*, 2018).

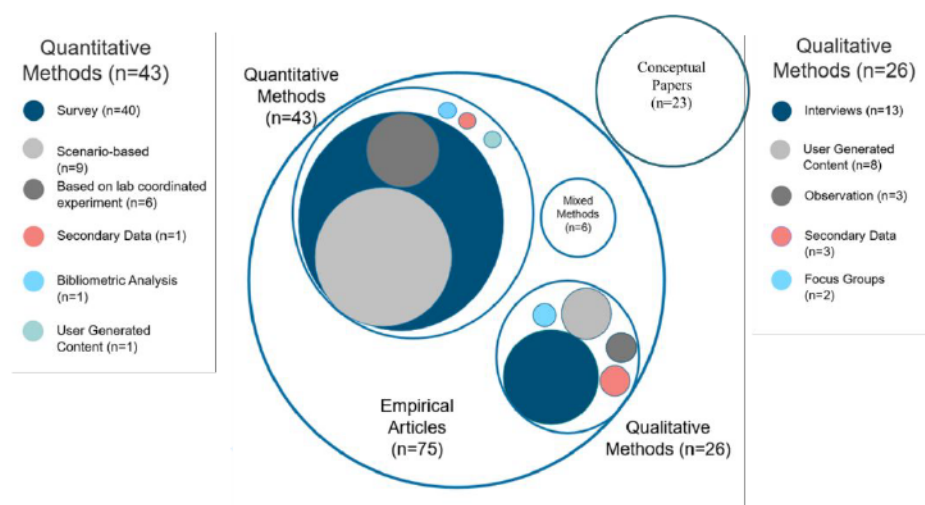


Figure 4: Methodological choices of the retrieved papers

4. Towards a Typology for Classifying the AI-ETs

Identification of customer-facing AI-ETs in the tourism sector allows further classification that emphasizes the experiential dimension of AI integration into the CX while taking into account the key aspects of the AICX (customer, technological device, and AI). Inspired by Flavian *et al.*'s (2019) Embodiment-Presence-Interactivity Cube, a three-dimensional typology is introduced to classify AI-ETs. Visualized as a cube (see Figure 5), each point represents a specific combination of these dimensions. As understanding of AI evolves rapidly, we adopt fluid definitions for typology components, presenting them as continua rather than dichotomies.

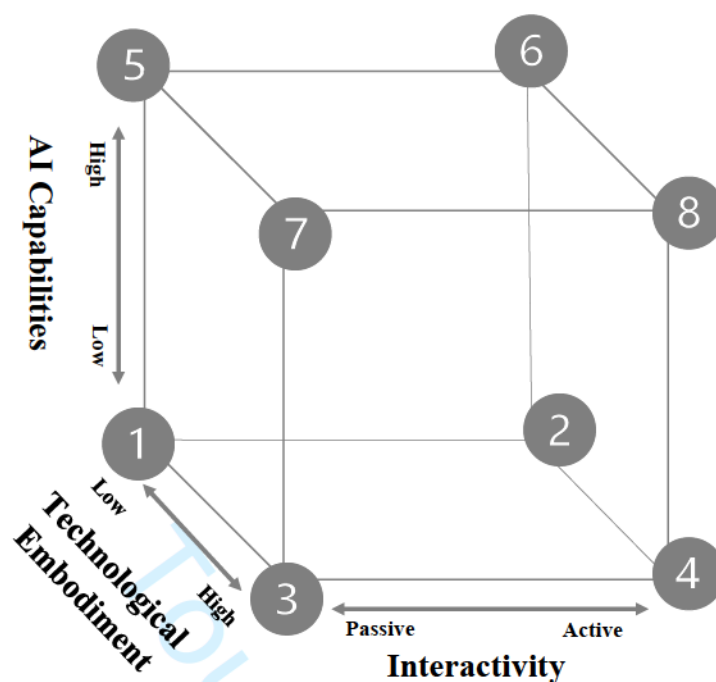


Figure 5: The AI-ETs

The AI-ET Cube transcends the boundaries of conventional technical descriptions by offering a comprehensive breakdown of the identified AI-ETs. It helps managers to gain insights into how various technologies impact the holistic experience. This comprehensive understanding enables informed decision-making and strategic planning, setting the stage for a future proofed and exceptional CX. Table III offers more examples of AICX. In relation to the three dimensions, we provide some additional description.

AI capabilities are defined as the varying degrees of intelligence displayed by an AI system, enabling it to effectively perform a wide range of tasks. For example, Huang and Rust (2018) identify multiple AI intelligences needed for service-related tasks, with each type (mechanical, analytical, intuitive, empathetic) demonstrating different task performance capabilities along with varying levels of difficulty that AI systems face in emulating each type. The higher the difficulty, the higher the level of AI capabilities (Huang and Rust, 2022).

In this study, *interactivity* is defined from a technological perspective; it refers to a dynamic process involving two-way communication, control, and real-time environment modification (Flavian *et al.*, 2019; Mollen and Wilson, 2010). Technological integration expands touchpoints and introduces new experiential forms (Hoyer *et al.*, 2020), along with increased human-technology interaction (Dix, 2017; Neuhofer *et al.*, 2014). It spans a continuum from passive to active interaction, where passive interaction requires no direct input from the customer (Cho and Choi, 2020) and active interaction necessitates customer inputs for technology functioning.

Technological embodiment is defined here as the level of interaction between a technological device and human senses and is characterized by dimensions of agency, location, and ownership. Embodiment is the notion that mind and body are closely connected, and physical experiences shape our cognitive processes and understanding (Longo *et al.*, 2008). The integration of technology with embodiment is referred to as technological embodiment (Verbeek, 2008) and relates to the level of interaction between a technological device and human senses in our everyday lives and experiences (Flavian *et al.*, 2019).

[Table I here]

5. Identified Gaps in Literature

Advancements in technology have catalyzed significant transformations, leading to profound operational shifts that restructured the services sector and reshaped the competitive landscape within, and consequently, altered customers' expectations, experiences, and behaviour. The SLR findings indicate that this paradigm shift has increased the focus on consumer

perception, adoption, and behaviour, exploring the ways in which technology shapes consumer decision-making processes and behavioural outcomes. Likewise, other research seeks to conceptualize and understand evolving dynamics between business operations and customer interactions. This study, by examining the interplay between AI and the CX, provides valuable insights into the emerging construct of AICX and guides future research endeavors. The findings are anticipated to have important implications for various stakeholders in the tourism field, including service and technology providers, customers, as well as government and regulatory authorities. The involvement of numerous stakeholders amplifies the significance of these implications, particularly through inter-stakeholder collaborations, for instance, collaborations among service and technology providers with researchers and policymakers. The following sections discuss these core themes and their implications.

It is important to mention that the emerging themes in AICX literature provide valuable insights across CX, marketing, and society. They shed light on sustainability, where AI can drive environmentally responsible practices by optimizing resource allocation and reducing waste. Additionally, AI's role in digital transformation enables businesses to deliver seamless, personalized experiences. Ethical considerations are paramount, with research examining AI algorithm ethics, data privacy, and transparency. Exploring emotional intelligence in AI enhances customer engagement and satisfaction. Lastly, studying AICX contributes to understanding and implementing omnichannel approaches for consistent, personalized experiences.

5.1. AICX Definition and Dynamics

Given rapid developments of AI-ETs and the relative novelty of the domain, there is uncertainty surrounding the conceptualization of AICX (Huang *et al.*, 2021). Very little is known about the multidimensionality of this emerging form of experience and its underlying dimensions. Limited knowledge is available concerning value creation in the context of AICX (Chen *et al.*, 2021; Neuhofer *et al.*, 2021). Further, the dynamics between customers, technology, and frontline employees have yet to be investigated (e.g. Odekerken-Schröder *et al.*, 2022). From a more practical perspective, it is now well-established that utilizing AI-ETs (e.g. remote virtual tourism) is transforming traditional tourism and leading to significant industry changes, including hiring strategies, job reskilling, and process redesign (Ivanov *et al.*, 2019; McCartney and McCartney, 2020; Solnet *et al.*, 2019). However, research attention remains scarce in exploring the implications and practical aspects associated with these changes (e.g. Allal-Chérif, 2022).

Addressing these gaps would provide insights to conceptualize and design AI-driven CX. This, in turn, would enable organizations to navigate the rapidly evolving domain, create unique value propositions, optimize interactions, and adapt their strategies and practices to align with industry changes. Within the tourism sector, where the significance of the experience is magnified, bridging this gap becomes paramount.

5.2. AICX Implementation

The implementation of AI in the tourism sector lacks clear understanding, hindering effective utilization and management (e.g. Fuentes-Moraleda *et al.*, 2020). Existing literature falls short in providing guidance for successful AI implementation in operations, particularly in

the management of CX in tourism and hospitality (e.g. Simoni *et al.*, 2022). Scepticism and concerns persist despite some businesses investing in AI, highlighting the need for comprehensive guidelines (e.g. Collins, 2020). Moreover, limited research has evaluated AI performance, investigated implementation strategies, and understood implementation challenges (e.g. Pillai and Sivathanu, 2020).

Identifying AI applications that provide maximum value and understanding their suitability for specific roles within tourism is an important research gap (e.g. Lee *et al.*, 2021).

Additionally, achieving compatibility between AI and human employees remains uncertain, despite its significance in preserving the hospitality sector's hospitable nature (e.g. Lei *et al.*, 2021). Research is insufficient in exploring the relevant key aspects like the concerns about technology replacing frontline employees, enhancing the acceptance of AI among employees, and understanding their attitudes, behaviours, and reactions (e.g. Qiu *et al.*, 2022). Research focusing on these gaps would provide organizations with valuable knowledge and guidance to enhance their AI implementation processes and outcomes. It would enable them to achieve compatibility between AI and human employees while upholding the essential hospitality aspect of the sector. Consequently, this is expected to improve the CX and increase operational efficiency.

5.3. AICX Outcomes and Measurement

The role of AI in shaping CX remains understudied. Research on the psychological implications of interacting with AI technologies, the emergence of emotions, and subsequent behavioural intentions is limited (Ivanov and Webster, 2021; Oh and Kong, 2022; Tuomi *et al.*, 2021). Current findings rely on hypothetical scenarios, necessitating field studies to

identify improvement strategies and understand how prior experiences shape the overall user experience (e.g. Fusté-Forné, 2021). Insufficient research exists at the organizational level concerning business outcomes such as customer acquisition, loyalty, engagement, and competitive advantage, as well as attachment and brand love (Loureiro *et al.*, 2021; McCartney and McCartney, 2020).

Developing a measurement scale for AICX, including identifying variables and dimensions for evaluating the components and the overall holistic experience is identified as a key research gap (e.g. Kabadayi *et al.*, 2019). Here, consideration of the "dark side" of AI integration, such as privacy concerns, and potential psychological harmful effects on customers is viewed as important (e.g. Grundner and Neuhofer, 2021). Limited attention has been also given to the economic aspect of AICX, ranging from the costs associated with implementation and conducting cost-benefit analyses to exploring the potential economies of scale (e.g. Ivanov *et al.*, 2019). Furthermore, there is a notable lack of emphasis on addressing the environmental, ethical, legal, and security dimensions of AI deployment. This gap persists despite the changing behaviours of customer and the rising concerns expressed by the public (Celuch, 2021; Fusté-Forné, 2021; Ivanov *et al.*, 2019).

Research on AICX outcomes and measurement equips decision makers with actionable insights to inform AICX design and optimize AI implementation. By exploring this theme, researchers and practitioners can mitigate risks and ensure that organizational strategies are in harmony with evolving societal needs and sustainability objectives.

5.4. *Consumer perspectives of AICX*

While research has been carried out on customers' intentions, perceptions, and attitudes towards AI integration into the experience, there have been few empirical investigations of this in real-life context, and particularly from hedonic, experiential, and social perspectives (e.g. Celuch, 2021). What is not yet clear is customers' preferences, willingness to engage with AI, and their expectations and required features for AICX (e.g. Han *et al.*, 2019). On the other hand, investigating customers' motivations, concerns, reluctance, or preference for non-digital experiences did receive the attention it deserves (e.g. Çakar and Aykol, 2021).

Another research gap pertains to customers' reactions and resulting behaviour, such as their willingness to pay for fully automated services and their perceptions of AI-ET appropriateness and preferred forms (Ivanov and Webster, 2021). Limited scholarly attention has been directed toward investigating interactivity, immersion, and emotional responses to AI integration (e.g. Chiang *et al.*, 2022).

One area of research that has been overlooked is AICX resulting behavioural intentions, considering factors like AI technology type, tourism context, and AI-ET form (e.g. Fuentes-Moraleda *et al.*, 2020). Another important area relates to exploring customers' reactions and attributions of responsibility in the face of AI service failures and comparing complaint behaviour between human frontline employees and AI-ETs (e.g. Tuomi *et al.*, 2021).

Addressing this theme and its underlying gaps would provide profound insights that not only shape AICX design but also elevate customization and personalization to new heights. It enables informed decision-making that aligns with customers' preferences. Additionally, the

profound impact would extend to customer recovery strategies, empowering organizations to address challenges and bounce back from setbacks swiftly and effectively.

5.5. Contextual Lenses for AICX

The contextual nature of CX is noted in core literature (Becker and Jaakkola, 2020). In the analysis of AICX in tourism, multiple key contextual lenses emerge, which deserve attention. The identified contextual lenses highlight the importance of considering the entire customer journey, emphasizing the need to invest resources in enhancing each stage. This encourages service providers to allocate resources and invest in enhancing the different stages of the customer journey, ultimately leading to improved AICX. Further, by considering cultural, personal, and demographic elements, organizations can create tailored experiences that resonate with individual customers.

5.5.1 The Cultural Lens

There is a significant gap in cross-cultural studies on AICX. Comparative studies involving customers from different cultural backgrounds would enhance our understanding of potential variations in AICX (e.g. Trunfio and Campana, 2020). Exploring cultural differences in attitudes towards AI, adoption, acceptance preferences, engagement, satisfaction, memorable experiences, and perceived service quality within the tourism sector can provide valuable insights (e.g. Jung *et al.*, 2018).

5.5.2 Tourism Sub-Contexts

The receptivity of different tourism sectors to AI has not been closely examined, particularly in understudied sub-contexts such as international events, entertainment destinations, fairs

and festivals, and religious monuments (e.g. Allal-Chérif, 2022). While previous studies provided some theoretical projections of AI integration, there is still very little understanding of this in real-world tourism contexts. A systematic comparison highlighting the differences between the various tourism contexts is also still lacking (e.g. Ducros and Euzéby, 2021).

5.5.3 Beyond the Encounter Stage

Existing research on AICX has primarily concentrated on the encounter stage, thus offering a limited understanding of the broader customer journey that includes the pre- and post-encounter stages. Current literature falls short in examining anticipatory (e.g. AI in promoting tourist attractions) and reflective phases (e.g. leveraging post-travel experiences to further promote the overall experience) of the experience (e.g. Tung and Law, 2017).

5.5.4 Moderating Variables

Insufficient attention has been given to the moderating variables of AICX, which indicates a research gap. Variables such as personal and demographic factors, including generations, age groups, regions, and genders, have not been thoroughly examined (e.g. McCartney and McCartney, 2020). Furthermore, behavioural and value-based segmentation, such as customers' technological skills, innovation readiness, and prior technology experience, have not received the necessary research attention (e.g. Zhu and Chang, 2020).

6. Conclusion

The integration of AI into various service encounters across the customer journey has reshaped the CX. This study introduces the AICX as a novel construct that has emerged from the continuous integration of AI-ETs. Following a SLR approach, this study examined and

analysed 98 articles on AICX in the tourism industry. By employing the TCCM framework, this review provides bibliometric information and analysis. It also introduces a novel framework for understanding AI-ETs. Five key themes that highlight gaps in the existing literature serve as a roadmap for future research.

6.1. Limitations

The increasing importance of the research area of AICX and the substantial scholarly attention it received in recent years pose certain limitations for this study. Despite adopting a comprehensive search strategy, there is still a possibility that papers were excluded due to a lack of clear relationships with CX research, a lack of clear relationships with tourism research, the use of a contextual label for the CX (e.g., museum experience), or not being included in one of the 5 selected databases for identifying relevant literature on the AICX. Furthermore, given the challenges scholars face in distinguishing AI and occasional mislabelling of non-AI applications, coupled with the impracticality of verifying technical details for every mentioned application in articles, there is a possibility that certain articles in our research have been inaccurately categorized under the AI domain.

6.2. Theoretical Implications

While building upon the prior research conducted by Hoyer *et al.* (2020) on CX transformation through technologies, and Buhalis *et al.* (2019) identification of disruptive areas in service experience, this study breaks new ground by introducing AICX as a standalone holistic construct. It is one of the pioneering studies that introduces the term 'AI-ETs' to encompass all AI-based and AI-empowered technologies implemented throughout the customer journey. By adopting the comprehensive concept of AICX to capture customers'

responses to the integration of AI-ETs into service encounters, this study expands the current theoretical understanding of CX.

Additionally, the study presents a novel framework, known as the AI-ETs Cube, for classifying AI-ETs. This framework provides a structured and comprehensive approach to categorize the diverse range of customer-facing AI-based and AI-empowered technologies implemented across the customer journey in the tourism sector. It extends previous literature on the classification of AI in services (Huang and Rust, 2018; Huang and Rust, 2022; Puntoni *et al.*, 2021) and offers guidance for future research on exploring the interplay between AI, technology, and CX.

6.3. Implications for future research

The study offers insights into existing research on AICX and provides directions for future investigations. The findings emphasize the growing significance of this research area and highlight the need for further scholarly attention. The research agenda based on content analysis of relevant literature on AICX and the identified gaps in literature are shown in detail in Table IV.

Future studies should explore the multidimensionality of AICX and examine the factors that contribute to its value. A comparison between AI-enabled and human-led service encounters is essential, as well as examining the dynamics between key agents in AICX and re-evaluating marketing fundamentals through the lens of AI. Additionally, future work should address questions about AI utilization across industries and the performance of businesses that have successfully implemented AI. Strategies for implementing AI while maintaining a balance with human touch should be investigated. Understanding the positive/negative

impact of AI integration on customers' emotions and behavioural intentions, evaluating business-level outcomes, and identifying metrics to assess AICX are important research areas. Furthermore, studying customer perspectives on AICX should go beyond attitudes and perceptions to encompass expectations, value perception, motivation, engagement, service failure, and complaint behaviour. It is also crucial to adopt various contextual lenses to examine and understand AICX, considering factors such as technology, culture, and personal variables.

[Table IV here]

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Tourism Review

Table I: Theories emerging clusters

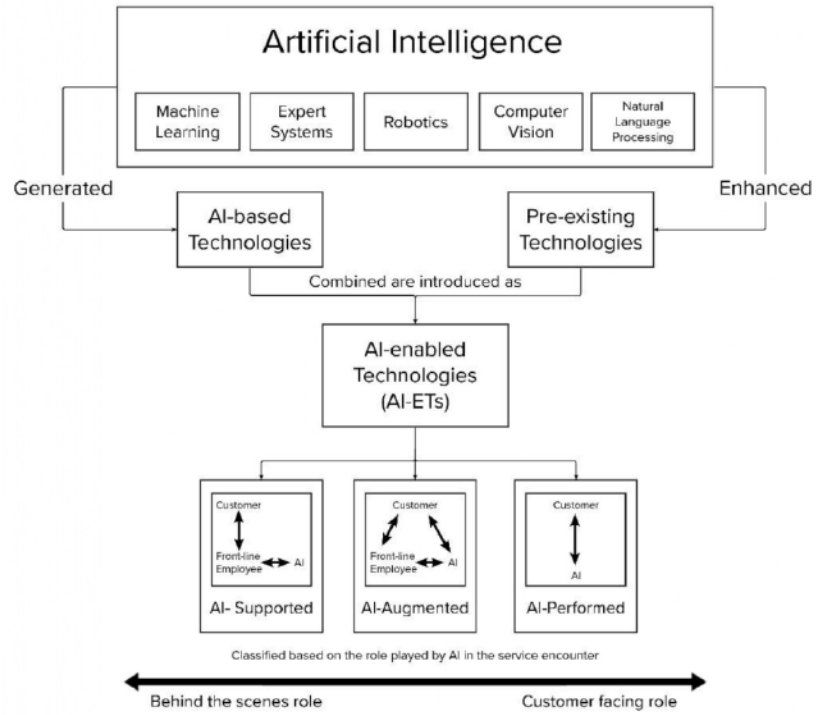
Emerging Theory Cluster	Examples from retrieved articles
Acceptance and Adoption	Unified Theory of Acceptance and Usage of Technology (UTAUT2) (Paulo <i>et al.</i> , 2018), Service Robot Acceptance Model (Fuentes-Moraleda <i>et al.</i> , 2020), Diffusion of Innovations (Kim and Han, 2020), Technology Acceptance Model (Shin and Jeong, 2020), Value-based acceptance model (Zhong <i>et al.</i> , 2021)
Evaluation	Stereotype content model (Zhu and Chang, 2020), Expectancy Disconfirmation Theory (Ducros and Euzéby, 2021), Cognitive-affective-conative model (Huang <i>et al.</i> , 2021), Social Exchange Theory (Loureiro <i>et al.</i> , 2021), Cognitive appraisal theory (Zhang <i>et al.</i> , 2021)
Marketing and Advertising	The hierarchy-of-effects theory (Lyu <i>et al.</i> , 2021), Product Level Theory (Ma <i>et al.</i> , 2021), Service Dominant Logic (Neuhof <i>et al.</i> , 2021), Five-sense experiences framework (Chen <i>et al.</i> , 2021), Value Co-creation (Jung and Tom Dieck, 2017), Experience Economy (Tung and Law, 2017)
Organisational Perspectives	Job Design Theory (Tuomi <i>et al.</i> , 2021), Process Theory (Wei <i>et al.</i> , 2019), Stakeholder Theory (Serravalle <i>et al.</i> , 2019)
Consumer Behaviour	Theory of Planned Behaviour (Cha, 2020), SOR Framework (Kim and Han, 2020), Variance Theory (Lacka, 2020), Theory of Reasoned Action (Aluri, 2017)

Table I: Distribution by journal

Journals Titles	Number of retrieved articles
International Journal of Contemporary Hospitality Management, Journal of Hospitality and Tourism Technology (n=2)	23
Journal of Service Management, Tourism Management Perspectives, Current Issues in Tourism, Tourism Review (n=4)	5
Tourism Management (n=1)	4
International Journal of Hospitality Management (n=1)	3
Technological Forecasting & Social Change, The TQM Journal, Journal of Travel & Tourism Marketing, Journal of Destination Marketing & Management (n=4)	2
Asia Pacific Journal of Tourism Research, The International Journal of Tourism Research, Qualitative Market Research: An International Journal, Electronic Markets, Cornell Hospitality Quarterly, Industrial Management & Data Systems, Leisure Studies, Computers in Human Behavior, International Journal of Engineering Business Management, Journal of Place Management and Development, International Journal of Event and Festival Management, Journal of Promotion Management, Journal of Business Research, International Hospitality Review, Worldwide Hospitality and Tourism Themes, Area, Journal of Hospitality Marketing & Management (n=17)	1
Grand Total	98

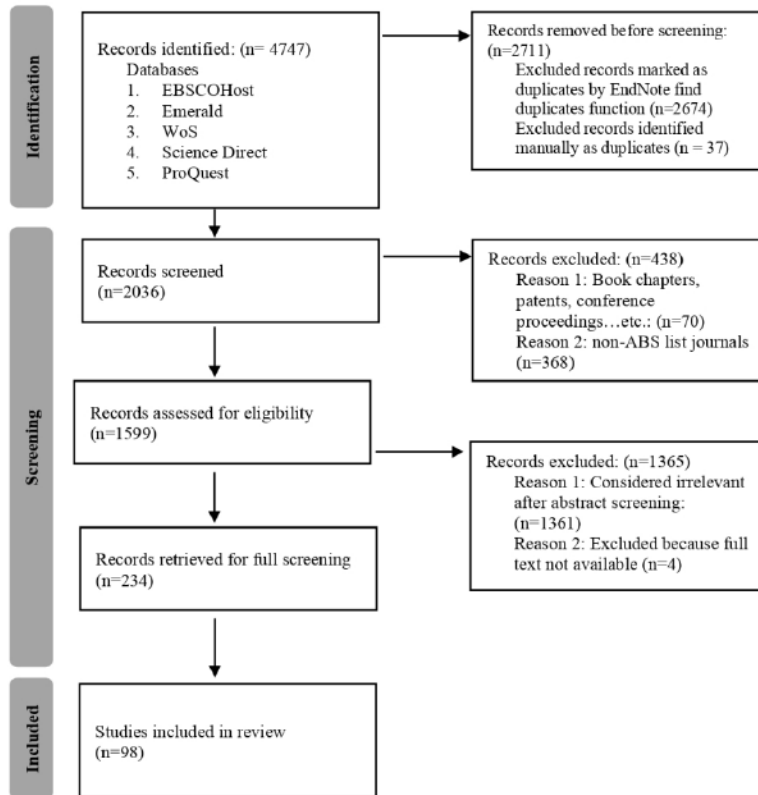
Table I: Examples of AI-ETs

AI-ET Cube Component	Definition	Level	Example
AI Capabilities	the varying degrees of intelligence displayed by an AI system, enabling it to effectively perform a wide range of tasks.	Low	Robot concierge providing basic services including greeting guests, providing information about the hotel and local attractions, making restaurant reservations, and assisting with check-in and check-out.
		High	Robot concierge that could personalize interactions using facial recognition technology.
Technological Embodiment	the level of interaction between a technological device and human senses, and is characterized by dimensions of agency, location, and ownership.	Low	VR tour of heritage location using a mobile device where users are immersed in a completely virtual environment.
		High	AR museum tour using a wearable device where virtual elements are overlaid onto the real world, blending digital content with the user's physical surroundings.
Interactivity	a dynamic process involving two-way communication, control, and real-time environment modification.	Passive	Voice-activated virtual assistant which respond to user commands and inquiries but do not engage in proactive or dynamic interactions.
		Active	Chatbots with advanced natural language processing capabilities which can ask follow-up questions, provide proactive suggestions, and engage in back-and-forth interactions to gather information and understand user needs more comprehensively.



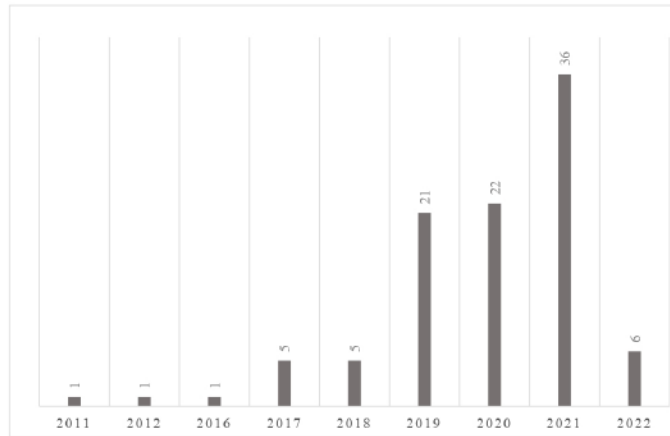
The AI-ETs

210x297mm (150 x 150 DPI)



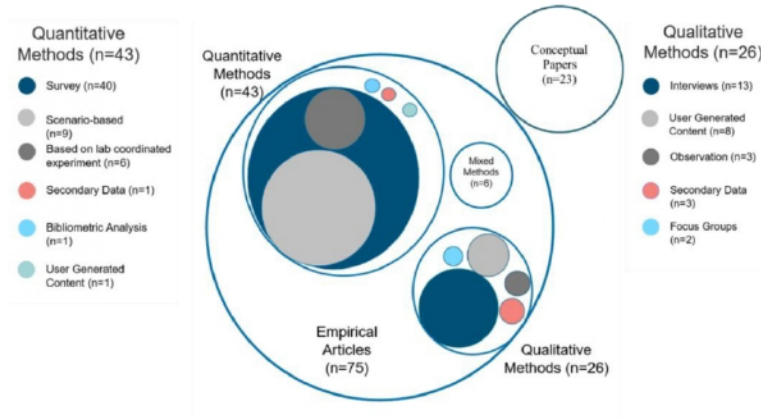
PRISMA Flowchart

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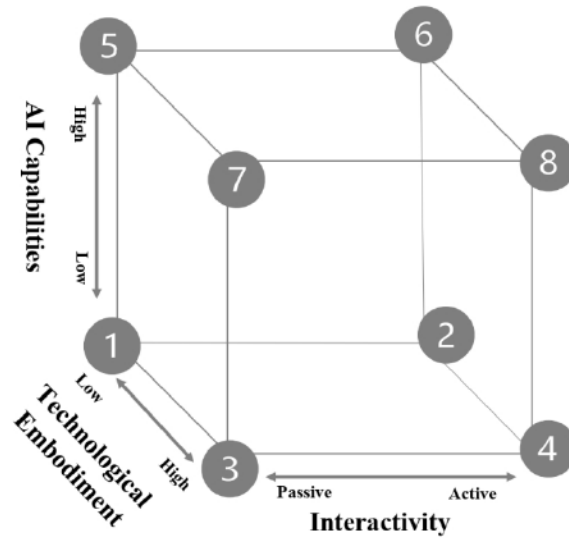
Distribution of articles by year

210x297mm (150 x 150 DPI)



Methodological choices of the retrieved papers

210x297mm (150 x 150 DPI)



The AI-ETs Cube

210x297mm (150 x 150 DPI)