

# Insights into Patterns of Technology Adoption and Acceptance by Tourism Employees

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## Abstract

This study critically evaluates research on technology acceptance in tourism from the employees' perspective to highlight literature gaps and guide future inquiry. A systematic keyword search was conducted in order to identify relevant articles that revealed a focus on limited theoretical frameworks and specific niches or stakeholders, leading to a notable gap in understanding employee technology acceptance compared to the well-explored consumer behavior. In addition, the scholarly narrative has predominantly been shaped by quantitative methods, while qualitative research approaches are virtually non-existent. Furthermore, the use of various theoretical frameworks highlights the complex connexion between technology and organisational ethos, which is central to understanding and supporting technology adoption. The paper not only furnishes a roadmap for researchers aiming to diversify the theoretical lineage of the discourse on technology acceptance within tourism but also holds profound implications for industry practitioners seeking to increase their comprehension of employee behaviour and needs.

## Keywords

Tourism, technology acceptance models, employees.

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## Introduction

In the dynamic and customer-centred realm of the tourism industry, the assimilation of technology by its workforce represents a pivotal aspect (Pourfakhimi, Duncan and Coetzee, 2019) that significantly contributes to both operational efficiency and the sector's competitive standing. The implementation and acceptance of technological innovations by employees are discussed through various robust theoretical frameworks that probe into complex determinants such as perceived usefulness, ease of use, the extent of social influence, and individual resistance to change (Davis, 1989; Venkatesh and Davis, 2000; Venkatesh et al., 2003). These models offer a profound understanding of the complexities entailed in technology adoption behaviours among tourism stakeholders. The examination of these frameworks through scholarly inquiry permits an enriched comprehension of the mechanisms through which customers or, in this case employees, within the tourism and hospitality industry adopt and integrate novel technological tools (Cimbaljević et al., 2023). Such an exploration is indispensable, not only in offering a comprehensive overview of technology acceptance patterns but also in augmenting the corpus of research specific to technology adoption within the tourism industry.

While the tourism sector is currently going through a process of technology adoption through the implementation of modern platforms, software, artificial intelligence (AI) and other innovative solutions (Gonzalez, Gasco and Llopis, 2020; Mody, Hanks and Cheng, 2021), there is still no consensus on how important it is for tourism employees to accept these technologies and to identify the main factors influencing their behaviour in the use of such technologies. Considering the abrupt technological progress towards AI, the current research aims to provide an introduction to a bibliographic analysis of the main

technology acceptance models used to better understand the behaviour of tourism employees in the context of a swift developing sector.

The acknowledgment of limited research focusing directly on employees within the context of technology acceptance and adoption, particularly in the tourism and hospitality industries, is an important observation. It signifies a gap in the existing literature and underscores the potential for further exploration into how theoretical models of technology acceptance can be applied to understand employee behaviours and attitudes towards new technological advancements. Therefore, this study aims at serving as a foundational step toward bridging this gap, suggesting that while significant work on customers has been done to develop and validate models like the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Artificial Intelligence Device Usage Acceptance (AIDUA) model, there is a clear opportunity for future research to focus more specifically on the employee perspective.

## 1. Literature review

Over the past two decades, technology has dramatically reshaped the hospitality and tourism industry, bringing ongoing innovations to the market (Law, Leung and Chan, 2020). A plethora of studies has delved into technology adoption across various user groups and sectors. Central to this scholarly inquiry is the exploration of both the drivers and outcomes of adopting new technologies. In the area of hospitality, Siguaw, Enz and Namasivayam, (2000) explored the hotel industry's utilization of IT solutions (e.g. Internet, Wi-Fi) and Chan, Okumus and Chan (2018) investigated barriers to environmental technology adoption in hotels. The consumer standpoint has been analysed in depth and from many dimensions like: use of websites (Herrero and San Martín, 2012), self-service technology (Lee, 2016), and interaction with service robots (Shin and Jeong, 2020). Moreover, research has increasingly focused on areas like human resource management and the sharing economy, along with specific technologies like artificial intelligence (Chi, Gursoy and Chi, 2022) or virtual and augmented reality (Jung et al., 2018; Hornoiu, Popescu and Militaru, 2023) while exploring consumer behaviour towards technology adoption (Gonzalez, Gasco and Llopis, 2020; Mody, Hanks and Cheng, 2021). Significant advancements in hospitality and tourism technology research have been made, with methods like qualitative content analysis and bibliometric analysis mapping knowledge trends. However, such studies often focus on niche topics like AI and primarily involve customers (Huang et al., 2021). As the industry evolves, recognizing technology acceptance from the employee perspective is crucial for growth. Employees are essential for effectively implementing and using technology, and understanding their attitudes is key to success. Given the lack of research on tourism employees' technology use, the upcoming discussion will provide a synthesis of the main academic models and methods used to analyze their behavior.

### *The Technology Acceptance Model (TAM) & The Technology Acceptance Model 2 (TAM2)*

The Technology Acceptance Model (TAM) was developed by Davis in 1989 to evaluate technology adoption, focusing on perceived usefulness (PU) and perceived ease of use (PEOU) as main factors that influence user intentions to make use of the technology. While PU refers to how technology improves work performance and, in some cases, daily life, PEOU refers to the ease and enjoyment of using technology (Davis, 1989). PEOU is assumed to be essential to the technical use of a device, which lately means that it has a weaker influence on technology acceptance compared to PU and has become less relevant as users have become more familiar with the use of technical devices in daily activities (Lunney, Cunningham and Eastin, 2016).

The Technology Acceptance Model 2 (TAM2), an extension created by Venkatesh and Davis (2000), adds constructs like social influence and cognitive instrumental processes to better predict technology acceptance, particularly in tourism. The model underscores its broad application and critical role in grasping technology uptake across tourism's evolving landscape, with its utilization spanning e-tourism platforms to extended reality, emphasizing trust, attitude, cultural differences, and technology type as pivotal factors influencing acceptance (Sun et al., 2020a; Hornoiu, Popescu and Militaru, 2023). TAM is often combined with other models like the Diffusion of Innovation Theory (DOI) (El-Gohary, 2012; Kim, Connolly and Blum, 2014; Vladimirov, 2015), Motivation Theory (Kim and Gatling, 2018), Resistance to Technological Innovation and Social Cognitive Theory (Kim, Hardin and Lee, 2023) to enhance predictive power. These theories collectively provide insights into how technology decisions are made, considering individual, organizational, and industry-specific influences.

### *Unified Theory of Acceptance and Use of Technology (UTAUT)*

Venkatesh et al. (2003) highlight TAM's significance, leading to the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT identifies key variables—social influence, effort expectancy,

performance expectancy, and facilitating conditions—as predictors of technology use. Social influence examines if one's social circle approves of their technology use. Effort expectancy is about the ease of using technology, akin to TAM's PEOU. Performance expectancy considers how technology helps achieve goals, related to PU. Facilitating conditions look at the availability of support and resources. The model also notes how gender, age, voluntariness, and past experience might modify these effects on technology acceptance and use (Venkatesh et al., 2003).

#### *Technology–Organisation–Environment (TOE)*

The Technology–Organisation–Environment (TOE) framework created by Tornatzky and Fleischer (1990) along with TAM represent two theoretical models widely used in the literature on the organization's IT innovation adoption. The TOE framework, represents a method that helps us understand the way companies decide to use new technologies by analysing three main factors: the technology (how useful and easy to use the technology is), the company's own characteristics – as in organizational factors (e.g., the company's commitment to local development), and the outside environment or setting the company operates in, which includes pressures from the competitors (Tornatzky and Fleischer, 1990). This framework has been applied in various studies to investigate how different factors from these three categories can influence a company's decision to adopt new technologies, including in the tourism sector, where it helps to understand the adoption of smart destination models by tourism companies or e-tourism companies (Vladimirov, 2015).

#### *Artificial Intelligence Device Use Acceptance model (AIDUA)*

Despite the fact that the advancement of artificial intelligence has disturbed the applicability of older theoretical models, TAM and its variations are still favoured by researchers when it comes to evaluating technology acceptance. However, the need for new models to capture AI acceptance led to the creation of the AI Device Use Acceptance model (AIDUA) (Gursoy et al., 2019). AIDUA extends previous frameworks by exploring AI technology acceptance through three stages: primary assessment, secondary assessment, and outcome (Gursoy et al., 2019). Initially, users assess AI's value based on social influence, pleasure, and human likeness. Next, they weigh the benefits against the costs, influencing their emotional responses and acceptance or rejection decision. Finally, in the outcome stage, users choose between AI and human services. This nuanced model offers a fresh perspective for examining technology acceptance, recognizing acceptance and rejection as distinct, non-opposing options (Gursoy et al., 2019).

Building upon the insights gathered from the literature review, the following section outlines the methodology employed in the study. This includes a detailed explanation of the selection criteria and the systematic approach utilized to identify relevant academic works focused specifically on tourism employees' technology adoption.

## **2. Methodology of sample selection**

The research database platform, Web of Science, was utilized to locate and select the studies included in this research paper's sample. Using the keywords formula “technology” AND “acceptance” OR “adoption” AND “model” AND “employees” OR “company” OR “industry” BUT excluding “traveller,” AND “consumers,” resulted in a total of 12,060 studies. After applying the condition of the must inclusion of “technology acceptance model” and “Hospitality, Leisure, Sport” category restriction, the number of relevant articles was reduced to 351. Subsequently, we further refined our search and after reading the abstracts of the 351 articles, for our research, we identified 20 articles that met our criteria, the main criterion being the application of theoretical model of technology acceptance or adoption in the research of the papers. These articles constituted the core of our research study.

## **3. Results and discussions**

The 20 papers on various theories that were published between 2000-2023 are shown in Table 1. In the context of our research, we discovered that the Technology Acceptance Model (TAM) was prominently featured in 15 articles out of the total 20 that we subjected to analysis. In 13 articles the TAM was analysed together with other theoretical models. Across one paper (Abou-Shouk, Lim and Megicks, 2016), TAM is used to investigate how environmental pressures, perceived benefits, and barriers influence e-commerce adoption among SME travel agents in Egypt. The study reveals that environmental pressures directly affect perceived benefits and barriers, while also indirectly influencing adoption behaviours. In the only one qualitative research (Guo et al., 2023), study employing a meta-analysis, the Technology Acceptance Model (TAM) was utilized to examine how job level and cultural factors influence hospitality employees' adoption of technology.

**Table no. 1. The 20 analysed papers for synthesis**

Authors	Themes	Framework applied	Authors	Thems	Framework applied
Abou-Shouk (2018)	Explores travel agents' attitudes towards online collaboration with DMOs	TAM + Collaboration Model	Lam, Cho and Qu (2007)	Explores factors influencing IT adoption in hotels in Hangzhou, China.	Task-technology fit + TRA
Abou-Shouk, Lim and Megicks (2016)	Explores factors influencing e-commerce adoption decisions	TAM	Lee, Man and Chan (2022)	Explores hotel management attitudes towards cogeneration systems in Hong Kong	TDM
Collado-Agudo, J., Herrero-Crespo, Á. and San Martín-Gutiérrez, H. (2023)	Examines factors influencing smart destination model adoption by tourism companies.	TAM + TOE	Parvez et al. (2022)	Study identifies factors influencing employees' intention to use robots	TAM + MT
El-Gohary (2012)	Explores factors influencing E-Marketing adoption in Egyptian tourism organizations	TAM + IDT	Soares, Mendes-Filho and Gretzel (2020)	Focuses on mimetic, coercive, and normative pressures shaping technology adoption.	TAM + IDT
Ghanem, Mansour and Adel (2017)	Examines national culture impact on e-tourism adoption in Egyptian companies	TAM + National Culture Theory	Spencer, Buhalis and Moital (2012)	Explores factors influencing technology adoption in small owner-managed travel firms	TAM + IDT + Theory of Organisational Decision-Making
Guo et al. (2023)	Meta-analysis on hospitality employees' technology adoption, influenced by job level and culture.	TAM	Sun et al. (2019)	Investigates cultural values on technology acceptance at individual level in hotels	TAM + IDT
Jeong, Lee and Nagesvaran (2016)	Explores employees' perceptions of using mobile devices in luxury hotel	SCT	Sun et al. (2020)	Integrates technology readiness into technology acceptance model in hospitality	TAM + TR
Kim and Gatling (2018)	Studies Virtual Employee Engagement Program (VEEP) impact on employee engagement and organizational outcomes	Institutional Theory	Sun et al. (2020)	Explores cultural values' impact on hotel technology adoption by employees	TAM + RTI + SCT
Kim, Connolly and Blum (2014)	Explores hotel managers' intentions to use mobile technology at work	TAM + TOE	Vladimirov (2015)	Examines factors influencing e-business adoption by small tourism firms in Bulgaria	TAM + CVScale + TR
Kim, Hardin and Lee (2023)	Examines user resistance to the implementation of a new POS system	TAM+SCT+ Resistance to IS Change	Wong et al. (2023)	Explores AI device acceptance in smart hotels with human presence	AIDUA + AT + TE

Notes: TAM=Technology Acceptance Model; TDM Theory=Technology Decision-Making Theory; MT=Motivation Theory; IDT=Innovation Diffusion Theory; TOE=Technology Organization Environment Framework; SCT=Social Cognitive Theory; CVSCALE=Cultural Value Scale; TR=Technology Readiness; RTI= Resistance to Technological Innovation; AIDUA=Artificial Intelligence (AI) Device Usage Acceptance; AT=Appraisal Theory; TE=Theory of Emotions; TRA=Theory of Reasoned Action;

Source: Developed by the author

Abou-Shouk (2018) utilized the Technology Acceptance Model (TAM) combined with a Collaboration Model to explore travel agents' attitudes towards online collaboration with Destination Marketing

Organizations (DMOs). Similarly, Ghanem, Mansour and Adel (2017) integrated TAM with Hofstede's National Culture Theory to examine the impact of national culture on the adoption of e-tourism technologies in Egyptian companies. Kim and Gatling (2018) applied Institutional Theory to assess the impact of the Virtual Employee Engagement Program (VEEP) on employee engagement and organizational outcomes. The research of Lee, Man and Chan (2022) explored hotel management attitudes towards cogeneration systems in Hong Kong using the Technology Decision-Making Theory (TDM) and identified key factors such as potential cost savings and environmental benefits that influence management's decision-making in adopting these energy-efficient systems.

Four research papers include TAM and IDT (Innovation Diffusion Theory). The articles expand TAM to include additional factors such as compatibility, privacy, security, normative beliefs, and self-efficacy, enhancing its capability to predict technology use and acceptance in online environments (El-Gohary, 2012). Another study incorporates Theories of Innovation Diffusion and Technology Acceptance, providing a framework to understand how new technologies are adopted in the travel sector (Spencer, Buhalis and Moital, 2012). It assesses how these theories apply specifically to small, owner-managed firms where decision-making can be highly centralized. IDT is highlighted for its role in explaining how technological innovations spread within a social system, influenced by factors such as compatibility and complexity (Soares, Mendes-Filho and Gretzel, 2020). Sun et al. (2019) integrates TAM and IDT to analyse the acceptance behaviour of hotel front office systems, suggesting that usability and functionality are critical for technology acceptance. Two studies have employed TOE and TAM to explore how technological, organizational, and environmental factors converge to influence IT adoption decisions (Kim, Connolly and Blum, 2014; Collado-Agudo, Herrero-Crespo and San Martín-Gutiérrez, 2023). Collado-Agudo, Herrero-Crespo and San Martín-Gutiérrez (2023) confirms that managerial and technological efforts are critical to the success of these initiatives, suggesting that companies need to engage both strategically and operationally for effective technology integration in the tourism sector. Kim, Connolly and Blum (2014) show that early adopters of mobile technologies in hotels can gain significant competitive advantages by enhancing guest services and operational efficiency.

Artificial Intelligence (AI) Device Usage Acceptance (AIDUA) Framework is used in only one research paper (Wong et al., 2023) to highlight the complexity of customer interactions with AI in hospitality settings and underscores the importance of human staff in enhancing customer service experiences, even in highly automated environments. Jeong, Lee and Nagesvaran (2016) and Kim, Hardin and Lee (2023) both discuss how self-efficacy, derived from Social Cognitive Theory (SCT), affects employees' willingness to embrace new technologies. High self-efficacy could reduce the resistance highlighted in the studies by Kim, Hardin and Lee (2023) and Sun et al. (2020a), facilitating smoother transitions in technological upgrades and implementations.

Technology Readiness (TR) was integrated with TAM (Vladimirov, 2015; Sun et al., 2020) to understand how individuals perceive technology, also how prepared they are to use these technologies effectively. In both cases, TR is seen as a critical determinant that can either propel or hinder the adoption of new technologies, depending on how technology's usefulness and ease of use are perceived by potential users. The study conducted by Lam, Cho and Qu (2007), focuses on understanding factors influencing IT adoption in hotels in Hangzhou, China. This research integrates the Task-Technology Fit (TTF) model with the Theory of Reasoned Action (TRA) to offer underscores the importance of both technological suitability and behavioural components in facilitating successful IT adoption in hotel settings.

Lastly, Parvez et al. (2022) combined TAM with Motivation Theory (MT) to identify factors influencing hotel employees' intention to use robots. Their study revealed that both intrinsic and extrinsic motivations are crucial in shaping employees' attitudes towards adopting robotic technologies.

## Conclusions

This research has rigorously explored the application of technology acceptance and adoption models within the context of the hospitality, leisure, and sports industries. Utilizing the Web of Science database, we initially identified over 12,000 potential articles. Through a meticulous filtering process that included criteria such as the inclusion of "technology acceptance model" and relevance to the specified industries, we narrowed this to 20 highly pertinent studies. Our analysis revealed that the Technology Acceptance Model (TAM) was the most frequently utilized theoretical framework, appearing in 75% of the selected studies, often in conjunction with other models. Notable among these is the integration of TAM with models like the Innovation Diffusion Theory (IDT) and the Collaboration Model, illustrating its versatility in examining various factors influencing technology adoption across different organizational levels and cultural settings. For instance, studies such as Abou-Shouk, Lim and Megicks (2016) and Guo et al. (2023)

highlight how environmental pressures, cultural factors, and job levels influence technology adoption behaviours in the hospitality sector. Significantly, the research extends beyond TAM to include frameworks like the Technology-Organization-Environment (TOE) framework, the Artificial Intelligence Device Usage Acceptance (AIDUA) Framework, and theories like the Technology Readiness (TR) and Social Cognitive Theory (SCT). These models provided deeper insights into how technological, organizational, and individual factors converge to influence technology adoption decisions.

This paper contributes to the existing literature by mapping out the theoretical landscape of technology acceptance in the hospitality industry and identifying key factors that influence these behaviours. Moreover, the application of multiple theoretical frameworks highlights the complex interplay between technology and organizational culture, which is crucial for understanding and enhancing technology adoption. Despite the comprehensive nature of this study, it is not without limitations. The scope was confined to articles in English, those published in "Hospitality, Leisure, Sport" category and indexed in the Web of Science, which may omit relevant studies from broader business and technology domains that could offer additional insights into technology adoption, also exclude relevant studies published in other languages or databases.

Future research could benefit from integrating additional theoretical frameworks that address emerging technologies and their unique challenges and opportunities within the hospitality sector, such as Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003). More, expanding research to include diverse cultural contexts would enrich the understanding of how cultural nuances influence technology acceptance and could pave the way for more customized adoption strategies. Studies could investigate the psychological and practical impacts of technology on employees, such as changes in job satisfaction, productivity, and the learning curve associated with new technology adoption. Moreover, research could explore the potential for technology to enhance collaboration and communication within organizations, possibly transforming traditional operational structures. In addition, given the dominance of quantitative methodologies in the literature surveyed, it is proposed that future investigations should pivot towards employing qualitative or mixed-method research designs to yield a more nuanced comprehension of tourism employee technology acceptance.

In conclusion, this study not only demonstrates the prevalent use of the TAM and its combinations in the hospitality industry but also opens avenues for future research to explore uncharted territories within this domain. The continuation of this research is essential for evolving and adapting technology acceptance models to the dynamic needs of the hospitality industry, ultimately enhancing both guest services and organizational efficiency.

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