Research Article

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From Anxiety to Satisfaction: The Influence of Technological Innovation on Shaping Customer Experience and Perceived Value in Leisure Services

Anksiyeteden Memnuniyete: Eğlence Hizmetlerinde Müşteri Deneyimi ve Algılanan Değerin Şekillenmesinde Teknolojik Yeniliklerin Etkisi

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Abstract

This paper examines the complex relationships among technological innovation, technological anxiety, perceived value and customer experience within the leisure services environment. Its main objectives are to explore the direct impact of technological innovation on customer experience and perceived value, as well as the direct impact of technological anxiety on customer experience and perceived value. Additionally, the study aims to examine the mediating role of perceived value and assess the moderating effects of technological anxiety. Data were gathered from 423 respondents using a survey questionnaire between May and July 2024 and examined using SEM. The main findings show that technological anxiety significantly increases both customer experience and perceived value. Technological anxiety positively influences both customer experience and perceived value, suggesting that overcoming technological challenges can increase customer satisfaction. Perceived value acts as a mediator in the relationships between technological anxiety and customer experience and between technological innovation and customer experience. Furthermore, the interaction between technological anxiety and technological innovation positively influences perceived value. The main findings highlight the need to continuously invest in advanced technologies, effectively manage technological anxiety and emphasize value-added benefits to increase customer satisfaction with entertainment services. These findings provide practical guidance for service providers seeking to leverage technological advances to create exceptional customer experiences.

Keywords: Marketing Research, Technological Innovation, Customer Experience, Perceived Value, Technological Anxiety.
JEL Codes: M31,O31,O33

Özet

Bu makale, eğlence hizmetleri sektöründe teknolojik yenilik, teknolojik kaygı, algılanan değer ve müşteri deneyimi arasındaki karmaşık ilişkileri incelemektedir. Temel amaçları, teknolojik yeniliğin müşteri deneyimi ve algılanan değer üzerindeki doğrudan etkisinin yanı sıra teknolojik kaygının müşteri deneyimi ve algılanan değer üzerindeki doğrudan etkisini araştırmaktır. Çalışma ayrıca, algılanan değerin aracılık rolünü incelemeyi ve teknolojik kaygının ılımlı etkilerini değerlendirmeyi amaçlamaktadır. Veriler, Mayıs ve Temmuz 2024 tarihleri arasında 423 katılımcıdan anket yoluyla toplanmış ve Yapısal Eşitlik Modeli kullanılarak incelenmiştir. Ana bulgular, teknolojik kaygının hem müşteri deneyimini hem de algılanan değeri önemli ölçüde yükselttiğini göstermektedir. Teknolojik kaygı, hem müşteri deneyimini hem de algılanan değeri olumlu yönde etkilemekte ve teknolojik zorlukların üstesinden gelmenin müşteri memnuniyetini artırabileceğini düşündürmektedir. Algılanan değer, teknolojik kaygı ile müşteri deneyimi arasındaki ve teknolojik yenilik ile müşteri deneyimi arasındaki ilişkilerde aracı rol oynamaktadır. Ayrıca, teknolojik kaygı ve teknolojik yenilik arasındaki etkileşim algılanan değeri olumlu yönde etkilemektedir. Ana bulgular, eğlence hizmetlerinden müşteri memnuniyetini artırmak için sürekli olarak ileri teknolojilere yatırım yapma, teknolojik kaygıyı etkin bir şekilde yönetme ve katma değerli faydala-

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rı vurgulama ihtiyacını vurgulamaktadır. Bu bulgular, üstün müşteri deneyimleri yaratmak için teknolojik ilerlemelerden yararlanmak isteyen hizmet sağlayıcıları için yararlı bir rehber niteliğindedir.

Anahtar Kelimeler: Pazarlama Araştırması, Teknolojik Yenilik, Müşteri Deneyimi, Algılanan Değer, Teknolojik Kaygı.
JEL Kodları: M31,O31,O33

Introduction

The rapid advancements in technological innovations (TIs), particularly in leisure services, have fundamentally reshaped how businesses interact with customers. Despite extensive research on technology adoption in hospitality and service industries (Bilgihan, 2016; Gretzel et al., 2015), there is a gap in understanding the specific impact of technological anxiety (TA) and how perceived value (PV) mediates the relationship between TIs and customer experience (CE). This study was conducted to address this gap by examining how technological advancements like AI, AR and VR affect CEs and PV, while also exploring the counterintuitive effects of TA.

The primary contribution of this study lies in its examination of the mediating role of PV in the relationship between TI, TA and CE. By incorporating TA into the framework, this research provides new insights into how overcoming technological challenges can enhance customer appreciation, aligning with the concept of eustress (Meuter et al., 2003). Unlike previous studies that focused solely on the benefits of TI (Buhalis & Amaranggana, 2015), this research explores both the positive and potentially adverse impacts, offering a more comprehensive view of how advanced technologies influence customer satisfaction (CS) and loyalty.

This study differentiates itself by not only investigating the direct effects of TI on CE but also by highlighting the critical mediating role of PV. Additionally, it introduces the concept of TA as a factor that can positively influence CE under certain conditions, thus contributing a novel perspective to the existing literature on technology adoption in leisure services.

Digitalization has revolutionized various industries, including hospitality and leisure, by enabling companies to meet individual customer preferences through automated systems rather than relying solely on human interaction. These advancements include personalized hotel services, AI-powered virtual assistants and tailored marketing strategies, which collectively enhance both operational efficiency and CS (Dang & Nguyen, 2023). In the hospitality sector, digital technologies such as chatbots and data-driven marketing tools are being leveraged to improve the guest experience and streamline operations, resulting in more personalized and engaging services (Wynn & Lam, 2023). These innovations highlight the transformative impact of digitalization on customer relationships and operational processes, offering significant value for all stakeholders involved (Ozdemir et al., 2023).

PV is a very important variable in determining CS and loyalty. It reflects a customer's evaluation of the benefits and costs associated with a service and reflects the overall benefit of the service from the customer's perspective (Zeithaml, 1988). TIs may increase PV by providing unique and useful features that are not available in traditional services. For example, personalized recommendations generated by advanced data analytics can increase PV by making services more relevant and attractive to individual customers (Gretzel et al., 2015; Huang & Rust, 2017). However, even with the potential benefits, the relationship between TI and CE is complex. While some customers readily adopt new technologies and appreciate the enhanced value they provide, others may experience TA that negatively impacts their overall experience (Jain, 2020; Jalilvand et al., 2012). Understanding how TA impacts the relationship between TI, PV and CE is critical for service providers seeking to optimize service delivery (Manser Payne et al., 2021; Pantano & Gandini, 2018; Witell et al., 2016).

The main objectives of this study are to examine the effects of technological innovations (TIs) and technological anxiety (TA) on customer experience (CE) and perceived value (PV). Specifically, the research aims to:

- Investigate the direct effects of TI on CE and PV.
- Explore the direct effects of TA on CE and PV.
- Analyze the mediating role of PV in the relationship between TA and CE.
- Evaluate the moderating effects of TA on the relationships between TI, PV and CE.

This study fills a gap in the literature by exploring the complex interactions between TI, TA, PV and CE within the framework of leisure services. Using Structural Equation Modeling (SEM), the research sheds light on how these variables interact and influence one another, offering valuable insights for service providers aiming to improve CS and loyalty.

Theoretical Framework

Leisure Services

Leisure services encompass a wide range of industries, including tourism, hospitality, entertainment and recreational activities, all of which are designed to provide consumers with enjoyable, memorable experiences (Lehto et al., 2024). These industries have been subject to increasing academic interest due to their significant contribution to global eco-

nomies and their focus on enhancing CS and CE. As consumer expectations evolve, leisure services must continuously innovate to remain competitive and relevant.

TI plays a critical role in the evolution of leisure services, helping to meet consumer demands for convenience, personalization and engagement. Technologies such as VR, MA and automated booking systems have been widely adopted across various sectors of leisure services, significantly enhancing CE (Bilgihan, 2016; Buhalis & Amaranggana, 2015; Park et al., 2023). For instance, VR experiences in tourism allow customers to "preview" destinations before booking, increasing their confidence and satisfaction with their travel choices (Guttentag, 2010). Similarly, MA have revolutionized how consumers interact with leisure services, providing real-time updates, easy access to information and personalized recommendations (Buhalis & Law, 2008). Recent studies highlight the accelerating use of smart technologies, such as artificial intelligence (AI) and augmented reality, in leisure services to create even more engaging and tailored experiences for users (Tussyadiah et al., 2020; Kim & Hyun, 2020).

The concept of PV is also pivotal in leisure services. Zeithaml (1988) defines PV as the consumer's evaluation of the overall utility of a service based on perceptions of what is received versus what is given. In the context of leisure services, PV has been shown to significantly influence CE, with high-value perceptions often leading to greater CS and loyalty (Sweeney & Soutar, 2001). Service providers that successfully integrate advanced technologies into their offerings can enhance the PV by providing consumers with unique, convenient and personalized experiences (Gretzel et al., 2015; Huang & Rust, 2017).

Despite the benefits of technology, the literature also highlights the challenge of TA in leisure services. TA refers to the apprehension or fear experienced by individuals when using new technologies (Meuter et al., 2003). In leisure services, TA can impact CE, particularly when customers are expected to interact with advanced systems without human assistance, such as self-service kiosks or MA. However, studies suggest that if TA is managed effectively through user-friendly interfaces and comprehensive support, it can be mitigated, allowing customers to fully engage with the technology and enjoy the benefits (Parasuraman & Colby, 2015; Roy et al., 2018).

Technological Innovations and Customer Experience

CE encompasses all aspects of a consumer's engagement with a service provider (Verhoef et al., 2009). TI have become fundamental in revolutionizing service delivery in a variety of sectors, especially in leisure services. The acceptance of advanced technologies such as VR, MA, self-service kiosks and sophisticated data analytics has significantly enhanced CE by offering greater convenience, personalization and interactivity (Bilgihan, 2016; Buhalis and Amaranggana, 2015). In entertainment services, CE is crucial to create immersive and engaging experiences that exceed customer expectations. Neuhofer, Buhalis and Ladkin (2014) argue technology-enhanced tourism experiences can transform customers' interactions with services and provide unique and memorable experiences that encourage long-term loyalty. For example, MA in the tourism sector enhance customers' overall experience by enabling them to easily access information, book services and participate in interactive activities (Kim & Qu, 2014; Sia et al., 2023).

The integration of TI into leisure services also allows for the collection and analysis of customer data, enabling service providers to offer customized services tailored to individual preferences and needs (Wang & Qualls, 2007, Chuang, 2023). This personalization increases CS by making the service more relevant and engaging. In addition, advanced technologies contribute to positive CE by streamlining operations, reducing wait times and providing real-time solutions to customer inquiries (Gretzel et al., 2015; Grewal et al., 2023). These innovations are consistent with the service-oriented concept (Vargo & Lusch, 2004), which emphasizes the co-creation of value through service interactions. The positive impact of TI on CE is well documented. Research shows that the use of modern technologies in service delivery leads to higher CS and loyalty. For example, Bilgihan (2016) found that millennial (Gen Y) customers, who are particularly tech-savvy, are more loyal to online shopping platforms that provide superior user experiences through TI. Similarly, Buhalis and Amaranggana (2015) showed that smart tourism destinations that use technology to personalize services significantly improve the overall traveler experience. Based on the extensive literature supporting the positive impact of TI on CE, this paper proposes the following hypothesis:

H1: Technological innovations positively influence customer experience in leisure services.

Technological Innovations and Perceived Value

TI is required to increase the PV for services in many industries, including entertainment services. PV is described as a consumer's valuation created by the costs and rewards associated with a service and represents the total value to the customer (Zeithaml, 1988). Higher PV is associated with improved CS, customer loyalty and good word-of-mouth (Sweeney & Soutar, 2001). In leisure services, TI can significantly increase PV by offering unique and useful

features that are not available in traditional services. For example, in tourism, VR allows customers to virtually explore destinations before visiting them, increasing their PV for the service (Guttentag, 2010). In addition, MA increase convenience and satisfaction by providing easy access to information, real-time updates and personalized recommendations, which in turn increases PV (Buhalis & Law, 2008).

TI also facilitates more personalized and interactive experiences that are highly valued by customers. Tailored services such as customized travel itineraries and special offers increase PV by addressing individual preferences and needs (Gretzel et al., 2006). Advanced data analytics and AI provide service providers with deeper insights into customer behavior and preferences, enabling the delivery of more targeted and relevant services (Huang & Rust, 2017). Research has consistently shown that AI positively impacts PV in various service settings. For example, Bilgihan (2016) found that the adoption of advanced technologies in e-shopping platforms leads to a higher PV among millennial customers. Similarly, Buhalis and Amaranggana (2015) showed that smart tourism destinations that leverage technology to personalize services significantly increase tourists' PV. Such evidence underscores the important contribution of TI in generating superior experience for customers. Based on the extensive evidence supporting the positive impact of TI on PV, this paper suggests the below hypothesis:

H2: Technological innovations positively influence perceived value in leisure services.

Technological Innovations and Technological Anxiety

Despite its numerous benefits, TI can also contribute to increased levels of TA among users. TA is characterized by the anxiety or fear that individuals experience when they use or consider using new technologies (Meuter et al., 2003). This anxiety can be caused by a variety of factors, including the complexity of the technology, lack of familiarity, perceived risk of failure and worries regarding safety and security.

The fast pace of technological progress often requires constant adaptation to new tools and systems, which can be overwhelming and create anxiety (Parasuraman & Colby, 2015). For example, the adoption of selffservice applications in retail and hospitality settings has been found to cause anxiety among customers who are not at ease with technology or are afraid of making mistakes in the transaction process (Meuter et al., 2000). Such anxiety can hinder the adoption and effective use of TI and ultimately affect user satisfaction and service outcomes.

TI is particularly relevant in the entertainment services sector where customers frequently interact with advanced intuitive services such as VR, MA or automated systems without direct human assistance. Research has shown that people with a high TA are lower likely to adopt or use these technologies, leading to decreased engagement and satisfaction (Meuter et al., 2003; Roy et al., 2018). For example, Guttentag (2010) noted that VR can enhance tourism experiences, but it can also cause anxiety among users who are not familiar with the technology. Moreover, the perceived complexity and usability of the technology can also exacerbate TA. If users find the technology difficult to understand or use, their anxiety levels are likely to increase, further discouraging them from interacting with the technology (Venkatesh, 2000).

Service providers should consider the potential for TA when implementing new technologies and ensure that they provide adequate support and user-friendly interfaces to reduce these concerns. Based on the review of literature highlighting the link between TI and TA, this study proposes the following hypothesis:

H3: Technological innovations positively influence technological anxiety.

Technological Anxiety and Customer Experience

TA, which is characterized by anxiety or fear when interacting with new technologies, can have a significant impact on CE. This anxiety often stems from concerns about the complexity of the technology, the potential for error and the perceived difficulty of using technological tools and systems (Meuter et al., 2003). High levels of TA can lead to avoidance behavior, in which customers deliberately avoid new technologies and thus miss out on the potential benefits and conveniences that these technologies offer.

Research has shown that TA negatively affects various aspects of customer behavior and perceptions. Roy et al. (2018) found that customers with high TA showed lower degrees of technology acceptance as well as satisfaction. Likewise, Parasuraman and Colby (2015) found an inverse relationship between TA and technology preparedness, with an impact on the total experience of the service. Fear of technology reduces the value and satisfaction of the service, leading to a negative experience.

Moreover, TA can affect technology usability and usefulness, which are critical drivers of CS and experience (Davis, 1989). Overall service evaluations are likely to be unfavorable when customer anxiety makes the technology difficult to understand and difficult to use. This underscores the importance of addressing TA to enable customers to fully engage with TI and have a positive service experience (Meuter et al., 2003; Venkatesh & Bala, 2008).

Addressing these concerns can lead to increased

CS and improved service evaluations, as reducing TA allows customers to better appreciate the convenience and efficiency provided by technological advances (Parasuraman & Colby, 2015; Yang & Forney, 2013). On the basis of the literature that highlights the adverse effects of TA on CE, the below hypothesis is proposed in this research:

H4: Technological anxiety has a direct negative impact on customer experience.

Technological Anxiety and Perceived Value

TA, defined as the anxiety or fear associated with the use of new technologies, can significantly influence how customers perceive the value of services that incorporate these technologies (Meuter et al., 2003). PV is the clients' total valuation of the benefits of a service, resulting from their evaluation of the benefits obtained in relation to the costs incurred (Zeithaml, 1988). When customers experience high levels of TA, their perceived benefits and ease of getting started with the technology may be adversely affected, resulting in lower PV.

With regard to mobile banking, Alalwan, Dwivedi and Williams (2016) found that TA has an adverse effect on PV and thus on the willingness to use mobile banking products. Their findings underscore the importance of addressing TA to increase PV and to help adopt mobile technologies. Research suggests that TA negatively influences various aspects of consumer behavior, including technology's perceived usability and usefulness, which are critical components of PV (Davis, 1989). When customers experience fear in using a technology, their overall assessment of the value of the service decreases. This relationship is particularly evident in self-service technologies, where the absence of human assistance can exacerbate feelings of anxiety and reduce PV (Meuter et al., 2000).

Furthermore, the negative impact of TA on PV can also be understood through the concept of technology readiness, which reflects the tendency of a person to adopt and use new technologies (Parasuraman & Colby, 2015). TA, which arises from users feeling overwhelmed or uncomfortable with new technologies, can lead to reduced PV in several ways. When users experience high levels of anxiety, they are less likely to fully engage with the technology, which diminishes their overall experience. For instance, TA can cause users to feel frustrated or confused, reducing their appreciation of the benefits that digital innovations are supposed to offer. This anxiety often results in avoidance behaviors, where customers may deliberately reduce their use of technology, even when it could improve their service experience (Lee et al., 2020).

Moreover, TA can create a cognitive dissonance where customers, despite recognizing the utility of the technology, still perceive it as too challenging or stressful to use. This mental strain negatively impacts their overall evaluation of the service, as they might perceive the service as more effortful or complicated than beneficial (Lee et al., 2023). As such, even though the technology offers enhanced personalization or convenience, the user's anxiety prevents them from recognizing or enjoying these benefits (Warshaw & Davis, 1985).

Finally, studies on the interaction of psychological factors with technology adoption show that TA is particularly problematic when users feel that their privacy is at risk or when they are resistant to innovation. These concerns amplify feelings of stress and reduce perceived emotional value, making the overall service experience less enjoyable (Chocarro et al., 2023).

Consumers exhibiting high levels of TA are expected to have lower levels of technology readiness, resulting in lower PV of technology-enabled services. This highlights the importance of addressing TA to ensure that customers can fully appreciate and derive value from TIs in leisure services. This study suggests the below hypothesis from the literature highlighting the negative impact of TA on PV:

H5: Technological anxiety has a direct negative impact on perceived value.

Perceived Value and Customer Experience

PV is a key concept in understanding consumer behavior and its implications for CE. PV is described in terms of the overall valuation of the benefits of a service on the basis of the customer's evaluation of the benefits obtained and the benefits provided (Zeithaml, 1988). It includes both functional and emotional benefits derived from a service (Zeithaml, 1988). High PV is associated with greater CS, loyalty and effective word-of-mouth, all of which are critical to positive CE (Sweeney & Soutar, 2001; Marcos & Coelho, 2022).

PV is central to the overall design of CE in the context of leisure services. Customers are more likely to have a satisfying and memorable experience when they receive high utility from a service. It is especially critical in the leisure industry, where customers seek not just functional benefits, but also emotional and experiential rewards (Pine & Gilmore, 1998; Carvalho & Alves, 2023). For example, a tourist who perceives high value in a travel package that offers unique experiences, excellent service and value for money is likely to have a more positive overall experience.

PV is a strong indicator of CE, as research has repeatedly shown. Research has indicated that if consumers feel a strong sense of value in a service, they report higher levels of satisfaction and a better ove-

rall experience (Cronin, Brady, & Hult, 2000, Tulcanaza-Prieto et al., 2023). This relationship holds across different service contexts, including hospitality, tourism and retail (Sweeney, Soutar, & Johnson, 1999). For instance, in the service industry, PV substantially influences guest satisfaction and their likelihood to repeat and refer the service to other customers (Oh, 1999; Paulose & Shakeel, 2022).

In addition, PV increases CE by meeting and exceeding customer expectations. When services deliver more value than expected, customers are delighted, resulting in exceptional CE (Parasuraman, Zeithaml, & Berry, 1988). This is particularly relevant in the leisure industry, where the goal is to design memorable and engaging activities that appeal to customers on an experiential level (Holbrook & Hirschman, 1982). Based on the literature supporting the positive influence of PV on CE, the proposed hypothesis is as follows:

H6: Perceived value positively influences customer experience in leisure services.

Moderating Role of Technological Anxiety

TA, which refers to the anxiety or concern that individuals experience when adopting new technologies, can significantly influence how customers perceive and interact with TIs (Meuter et al., 2003; Venkatesh, 2000). In the context of leisure services, TA can affect customers' appreciation of the value of TI as well as their overall experience (Parasuraman & Colby, 2015). For service providers seeking to improve CE through technological advances, it is critical to appreciate the moderating role of TA.

Moderation refers to a factor that has an effect on the strength or toward the orientation of the link between an independent variable and a dependent variable. In this case, TA moderates the link between TI (independent variable) and PV (mediating variable) (Baron & Kenny, 1986; Hayes, 2013). Specifically, high levels of TA may weaken the positive relationship between TI and PV because anxious customers may not fully appreciate or utilize the benefits of new technologies (Meuter et al., 2003; Venkatesh & Bala, 2008). This moderating effect highlights the need to address TA to ensure that customers derive maximum PV from TI (Yang & Forney, 2013; Parasuraman & Colby, 2015).

The moderating role of TA has been examined in several contexts and has been shown to have a significant impact on technology adoption and user experience. Meuter et al. (2003) examined how TA affects individuals' use and satisfaction with selfservice interfaces. Their findings indicated that individuals with high TA are both less frequent users of self-service technologies and less satisfied with their use, highlighting the adverse impact of TA on PV and user experience. In addition, Venkatesh et al. (2003) integrated TA into the Unified Theory of Acceptance and Use of Technology (UTAUT) and demonstrated that TA negatively affects users' ratings of usability and utility. This relationship suggests high TA may diminish the perceived benefits of TI, leading to lower PV.

Empirical studies provide robust evidence for the moderating role of TA. For example, Roy et al. (2018) investigated factors that are associated with customer acceptance and opposition to smart technologies in the retail sector. Their research found that TA significantly moderates the link from perceived benefits of smart technologies to consumer acceptance, while higher levels of anxiety weaken this relationship. This finding highlights the need to address TA in order to increase PV and customer acceptance. Another study by Sinkovics, Stöttinger, Schlegelmilch and Ramiah (2002) examined the effect of TA on e-commerce shopping behavior. The results indicated that individuals with strong TA are lower online shoppers and perceive less value from e-commerce platforms. This suggests that TA may be a significant barrier to the effective use of TI, thereby reducing PV. Based on the literature, the below hypotheses are suggested:

H7: Technological anxiety moderates the relationship between technological innovations and perceived value, such that the relationship is weaker for individuals with high technological anxiety.

H8: Technological anxiety moderates the relationship between perceived value and customer experience.

Mediating Role of Perceived Value

Mediator is a quantity which explains the relation of an independent quantity to a dependent quantity. Here, PV serves as an intermediary between TI (independent) and CE (dependent). When customers encounter TI, their PV increases due to increased convenience, personalization and overall service quality (Gallarza et al., 2016; Kim et al., 2021). This increased PV subsequently leads to more positive CE (Zeithaml, 1988; Parasuraman et al., 2005; Rahman et. al., 2022).

Several studies have examined PV as a mediator. Wang, Lo and Yang (2004) investigated PV as a mediator between TI and CS. Their results indicated that PV significantly mediates this relationship, highlighting its important role in enhancing CE. In the travel and leisure industry, Chen and Chen (2010) found that PV mediates the relationship between service quality and behavioral intentions. Their study showed better service quality leads to higher PV, resulting in higher CE and loyalty. This suggests that PV represents a key mechanism through which service improvements translate into better customer outcomes.

Empirical studies further support the mediating role of PV. For example, Ryu, Han and Kim (2008) examined the mediating impact of PV in the link between physical environment quality and customer happiness in the restaurant industry. They found that PV fully mediated this relationship, highlighting its importance in evaluating service. In addition, Oh (1999) examined the mediational role of PV in the link between price fairness and CS in the service industry and found that PV significantly mediated the relationship, suggesting that customers' value perceptions are crucial in determining their total experience satisfaction.

TIs like MA, VR and automated systems enhance PV with more comfort, personalization and superior service quality. These enhanced value perceptions lead to improved CEs as customers perceive that they receive more benefits relative to the costs incurred. On the basis of the literature, we hypothesize that

H9: Perceived value mediates the relationship between technological anxiety and customer experience in leisure services.

H11: Perceived value mediates the sequential relationship between technological innovations, technological anxiety and CE in leisure services.

H12: Perceived value mediates the relationship between technological innovations and customer experience in leisure services.

Moderated Mediation Effect of Technological Anxiety

Moderated mediation occurs when the intensity or strength of a mediated link varies with the degree of a moderating variable (Edwards & Lambert, 2007; Preacher et al., 2007). Within the present case, TA moderates the indirect influence of TI on CE through PV. Specifically, for customers with high TA, the positive effect of TI on PV and consequently on CE is expected to be weaker than for customers with low TA (Hayes, 2015; Zhao et al., 2010).

Both theory and empirical research have been conducted. Preacher, Rucker and Hayes (2007) introduced methods for testing moderated mediation and emphasized the importance of examining how mediators and moderators interact to influence outcomes. Their framework is used extensively in several areas, including marketing and consumer behavior. TI improves PV by increasing convenience, personalization and service quality. However, TA may weaken this positive relationship. Venkatesh et al. (2003) emphasized that TA reduces ease of use and usefulness perceptions, which are critical components of PV. Therefore, high levels of TA may reduce the perceived benefits of TI.

PV significantly increases CE by providing greater satisfaction and perceived benefits. However, when TA is high, customers may not fully appreciate or utilize the benefits provided by TI, resulting in a weaker impact on CE (Roy et al., 2018). Support for the moderated mediation role of TA has been provided by empirical studies. For example, a study by Thong, Hong and Tam (2006) examined the moderated mediation impact of TA in the context presented by e-government services. They found that TA moderated the mediating role of perceived ease of use on the link from system quality to user satisfaction. This suggests that large amounts of TA may decrease the positive effects found for TI on PV and consequently on user satisfaction.

Another study by Chang, Wong and Fang (2014) investigated the moderated mediation effect in the environment of digital banking services. Their study found that TA moderated the indirect link from service quality to customer loyalty through PV. In particular, the positive effect of quality of experience on customer loyalty through PV was weaker for customers with a high level of TA. Similar results can be expected in the leisure services sector. For example, customers with high TA may find it difficult to navigate and use new technologies such as MA, VR experiences and automated systems. As a result, their PV of these TIs may be lower, resulting in a diminished net value impact on overall CE. On the basis of the literature, the study presents the following hypotheses:

H10: Technological anxiety moderates the relationship between technological innovations and customer experience in leisure services.

H13: Technological anxiety moderates the relationship between technological innovations and perceived value in leisure services.

H14: The interaction between technological anxiety and technological innovations positively influences perceived value, which in turn enhances customer experience in leisure services.

Regarding the difference between H7 and H13; H7 examines how TA moderates the relationship between TIs and customer experience, focusing on the direct impact on CS and interactions, while H13 explores how TA influences the PV derived from these innovations, affecting customers' overall evaluation of the service's worth.

Methodology

Research Design

To examine the interactions between TI, PV, CE and TA in the context of leisure services, this study utilized a quantitative research design. Second, we aimed to examine whether TA is a mediator of TI/PV.

The Sample and the Collection of Data

The study sample included 423 respondents who were selected using a convenience sampling method between May and July 2024 to allow for the generalizability of the results. To ensure a diverse and representative sample, participants were identified through a combination of purposive and convenience sampling methods. The study targeted individuals who were active users of leisure services and familiar with TIs in areas such as tourism, hospitality and entertainment. Participants were recruited based on their experience with digital technologies such as MA, VR tours and automated booking systems, as these innovations were central to the study.

The online survey format was chosen to provide convenience and accessibility to a wide geographic range of participants. The platform used for administering the survey was Google Forms, due to its ease of use and ability to capture large datasets efficiently. Respondents were assured of the anonymity and confidentiality of their responses and informed consent was obtained before they proceeded with the survey. The survey included statements framed in general terms, such as "the service ..." to allow participants to reflect on their experiences across different types of leisure services.

Measures

TI, which was assessed using a measure adapted from Wang and Ahmed (2004) that included three items: ''The service provider uses the latest available technology," ''The technological features of the service are very innovative," and ''The service provider frequently updates its technology to improve the user experience." CE, assessed using a scale adapted from Brakus, Schmitt and Zarantonello (2009), consisting of three items: ''My overall experience with this service is enjoyable," ''The service provides a memorable experience," and ''This service engages me in a meaningful way.".

PV is measured using a scale modified from Sweeney and Soutar (2001). The scale consists of the following three elements: 'The service offers good value for money,' 'I believe the benefits of this service outweigh the costs,' and 'I get good value for what I pay for this service. TA, measured using a scale adapted from Meuter et al. (2003), which included three items: "I feel anxious about using new technologies", "New technologies often intimidate me" and "I hesitate to use new technologies for fear of making mistakes".

Ethical Considerations

The research adhered to the principles of ethics during the entire project. All participants received written consent and were assured that the participation was optional and that their answers would be kept confidential.

Model Overview

The suggested SEM model, presented in Figure 1, examines the complex relationships among TI, TA, PV and CE within leisure services. The model incorporates several hypotheses to examine these dynamics, represented by the following constructs and their respective indicators.

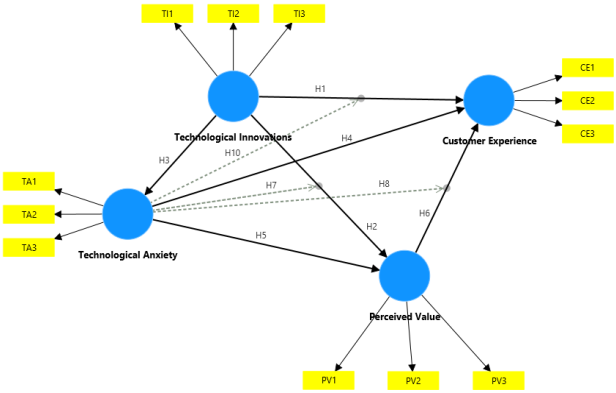

Figure 1. The proposed SEM model

This model proposes that although TI has the potential to enhance CE and PV, the presence of TA can modify these relationships. Specifically, it examines how TA can affect CE both directly and indirectly (via PV). In addition, the model tests the role of TA in moderating the link among TI and PV, suggesting that increased levels of anxiety may reduce the perceived benefits of technological advances.

Results

Factor Loadings

Factor loadings indicate the connection of the observed variables (items) to the latent constructs (factors). High factor loadings indicate an element is a strong representative for the relevant factor (Hair et al., 2010; Kline, 2015). Specifically, a factor loading close to 1 indicates that the item is closely related to the latent construct, whereas lower loadings indicate a weaker relationship (Field, 2013; Tabachnick & Fidell, 2013). Table 1 presents the items grouped into four constructs: CE, PV, TA and TI.

Table 1. Factor Loadings

Item	CE	PV	TA	TI
CE1	0.813			
CE2	0.858			
CE3	0.895			

PV1		0.912		
PV2		0.955		
PV3		0.937		
TA1			0.859	
TA2			0.926	
TA3			0.891	
TI1				0.900
TI2				0.907
TI3				0.746

CE1 (0.813), CE2 (0.858) and CE3 (0.895) show high loadings on the CE factor, indicating they are strong indicators of CE. Loadings above 0.7 suggest that these items reliably measure CE (Hair et al., 2010). Items PV1 (0.912), PV2 (0.955) and PV3 (0.937) have very high loadings on the PV factor. Loadings above 0.9 indicate that these items are excellent indicators of PV, capturing the essence of what customers find valuable in the service (Fornell & Larcker, 1981). For TA, items TA1 (0.859), TA2 (0.926) and TA3 (0.891) exhibit strong loadings, accurately reflecting the apprehension or fear associated with using new technologies (Meuter et al., 2000). Items TI1 (0.900), TI2 (0.907) and TI3 (0.746) load highly on the TI factor, with TI1 and TI2 being particularly strong indicators. Although the loading for TI3 is slightly lower, it is still considered strong, indicating its reliability as an indicator of TIs (Buhalis & Amaranggana, 2015). The high factor loadings across all constructs confirm that the items used in this study are valid indicators of their respective constructs. This validation is critical to ensure that the measures of the study accurately reflect the theoretical concepts being investigated (Hair et al., 2010).

Reliability and Validity Results

Table 2 provides the reliability and validity metrics for the constructs in this study. These metrics include Cronbach's alpha, composite reliability and AVE.

Table 2. Reliability and Validity Results

Construct	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
CE	0.817	0.819	0.891	0.733
PV	0.928	0.930	0.954	0.874
TA	0.872	0.882	0.921	0.796
TI	0.815	0.856	0.889	0.730

Cronbach's alpha is a scale of inner coherence that reflects the degree to which a group of items are related to each other within the group. Scores above 0.7 are regarded as adequate and scores greater than 0.8 indicate good reliability (Nunnally & Bernstein, 1994). Overall, this research shows that all components have satisfactory reliability, with Cronbach's alpha scores between 0.815 and 0.928.

The composite reliability also assesses the internal consistency validity. Results over 0.7 are considered acceptable (Fornell & Larcker, 1981). All constructs in this study have composite reliability values greater than 0.8, suggesting good internal consistence.

Average variance extracted values (AVE) represent the proportion of variance accounted for by a given construct relative to variance resulting from possible measurement bias. An AVE of 0.5 or more indicates that the construct explains over 50% of the variation in its indicators. All of the constructs in this study have AVE values well above 0.7, indicating good convergent validity (Fornell & Larcker, 1981).

These reliability and validity results confirm that the instruments used in this study are both reliable and valid. Each construct has strong internal consistency and convergent validity, ensuring that the items are suitable for measuring the intended constructs.

Variance Inflation Factor (VIF) Results

The Variance Inflation Factor is a measure of the degree of multicollinearity between items in a multiple regression model. A VIF value greater than 10 indicates significant multicollinearity that requires further investigation or adjustment. Table 3 presents the VIF results for the items analyzed in this study.

Table 3. VIF results

Item	VIF	Item	VIF	Item	VIF	Item	VIF
CE1	1.595	PV1	3.032	TA1	2.070	TI1	2.279
CE2	1.956	PV2	5.097	TA2	2.873	TI2	2.271
CE3	2.241	PV3	4.109	TA3	2.403	TI3	1.474

The VIF scores for CE items range from 1.595 to 2.241, indicating low multicollinearity among these items. Similarly, the VIF scores for PV items are between 3.032 and 5.097, all of which are below the threshold of 10, indicating an acceptable level of multicollinearity. However, PV2 has a higher VIF of 5.097, which may warrant further investigation if multicollinearity becomes an issue. The TA items have VIF values between 2.070 and 2.873, indicating low multicollinearity among them. For the TI items, the VIF values are in the band of 1.474 to 2.279, significantly lower than the threshold, indicating low multicollinearity.

Overall, the VIF results suggest that there is no severe multicollinearity among the items measuring CE, PV, TA and TI. PV2 has a relatively high VIF value (5.097), but this value should be viewed with caution. These results indicate that the items used in the regression models are appropriate and that multicollinearity is not a significant problem for this research.

Discriminant Validity Findings

Discriminant validity is assessed to confirm that constructs that are intended to be distinct are, in fact, distinct. The Fornell-Larcker test and cross-loadings are standard methods for evaluating discriminant validity. Table 4 presents the results of this assessment.

Table 4. Discriminant Validity Results

Constructs	CE	PV	TA	TI	TA x PV	TA x TI
CE	1.000					
PV	0.631	1.000				
TA	0.575	0.478	1.000			
TI	0.904	0.583	0.513	1.000		
TA x PV	0.277	0.281	0.168	0.245	1.000	
TA x TI	0.093	0.236	0.145	0.070	0.563	1.000

The correlation between CE and PV is 0.631, indicating a moderate relationship. The correlations of CE with TA (0.575) and TI (0.904) suggest relatedness, yet they remain distinct based on theoretical definitions (Fornell & Larcker, 1981). PV exhibits moderate correlations with TA (0.478) and TI (0.583), indicating some degree of relatedness while maintaining distinction (Fornell & Larcker, 1981). TA shows moderate correlations with CE (0.575), PV (0.478) and TI (0.513), suggesting that while they are related, TA remains a distinct construct (Meuter et al., 2003). TI has high correlations with CE (0.904) and moderate correlations with PV (0.583) and TA (0.513), reflecting its significant role while remaining theoretically distinct (Parasuraman & Colby, 2015).

The interaction term TA x PV has lower correlations to the other variables, providing evidence for its discriminant validity. Similarly, interaction term TA x TI has relatively low correlations to other constructs, further indicating its discriminant validity (Venkatesh, 2000). The finding suggest that the constructs measured in this research are sufficiently distinct from each other, as evidenced by the correlations shown in the table. Although some constructs have moderate to high correlations, they still represent distinct theoretical constructs. Ensuring discriminant validity is critical to the integrity of the SEM and the overall validity within the study (Hair et al., 2010).

Model Fit Results

Model fit indices are critical in assessing the ability of the suggested model to fit the observable data. The model fit indices are presented in Table 5.

Table 5. Model Fit Results

Measure	Saturated Model	Estimated Model
SRMR	0.061	0.060
d_ULS	0.287	0.283
d_G	0.177	0.167
Chi-square	463.103	432.839
NFI	0.866	0.874

The Standardized Root Mean Square Residual (SRMR) is an unbiased criterion of fit, expressing the standardized difference in the observed and predicted correlations. Scores below 0.08 are usually regarded as indicating a strong fit (Hu & Bentler, 1999). In this study, both the saturated and estimated models have SRMR scores below 0.08, indicating a strong fit. In PLS-SEM, d_ULS assesses the discrepancy of the observed and estimated covariance matrices. Lower values indicate a better fit. The estimated model has a slightly lower d_ULS value than the saturated model, indicating an acceptable fit. Another fit measure in PLS-SEM is d_G, which evaluates the distance between the observed and model-implied correlation matrices. Lower values indicate a better fit. The estimated model has a lower d_G value, indicating a slightly better match. The Chi-square statistic tests whether observed and expected covariance matrices differ, with lower values indicating a better match. The estimated model has a lower Chi-square value than the saturated model, indicating a bet-

ter fit. However, an important point to note is that Chi-square is subject to sample size and often yields significant values in large samples (Bollen, 1989).The NFI (Normed Fit Index) evaluates model fit by comparing the Chi-square value of the model to that of a null model. Values above 0.90 are generally considered indicative of a good fit (Bentler & Bonett, 1980). In this study, the NFI values for both models are slightly below 0.90, indicating an acceptable fit with potential for improvement.

Overall, the model fit indices indicates that the estimated model gives an adequate match to the data. SRMR values are below the 0.08 level, indicating a good fit. Lower d_ULS and d_G values for the fitted model compared to the saturated model indicate an improved fit. The Chi-square value is lower for estimated model while the NFI value, although close to 0.90, indicates that there is room for further refinement.

Path Coefficient Analysis

Path coefficient analysis in SEM involves evaluating direct and indirect links among variables in a proposed model. Path coefficients are standardized regression weights that reflect the intensity and strength of the relationships between variables (Kline, 2015; Ullman, 2006). This analysis provides insight into how the independent variables influence the dependent variables, either directly or through mediating variables. Table 6 presents the path coefficients, including their sample original values, sample means, standard deviations, T-statistics and P-values.

Table 6. Path Coefficients Analysis Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
H1: TI -> CE	0.178	0.173	0.052	3.425	0.001
H2: TI -> PV	0.149	0.157	0.054	2.767	0.006
H3: TI -> TA	0.223	0.223	0.052	4.271	0.000
H4: TA -> CE	0.570	0.566	0.052	10.908	0.000
H5: TA -> PV	0.414	0.413	0.046	8.941	0.000
H6: PV -> CE	0.449	0.454	0.050	8.928	0.000
H7: TA x TI -> PV	0.078	0.075	0.057	1.374	0.169
H8: TA x PV -> CE	-0.050	-0.054	0.049	1.018	0.309

H1: The analysis supports this hypothesis, indicating that TI has a powerful, positively important and significant effect on CE. Thus, this finding is consistent with the literature that emphasizes on role of technological advancement to improve CE and overall experience (Bilgihan, 2016; Buhalis & Amaranggana, 2015). H2: This hypothesis is confirmed by showing a significant positive relationship between TI and PV. This supports the idea that advanced technologies enhance the perceived benefits of services, thus increasing their value (Gretzel et al., 2015; Huang & Rust, 2017). H3: The results support this hypothesis, indicating that TI significantly increases TA. This is consistent with findings that new technologies can cause anxiety and fear in users, especially when they are unfamiliar with the technology (Meuter et al., 2003). H4: The hypothesis is supported, showing that TA has a statistically significant positive effect on CE. This result is somewhat counterintuitive; as higher TA typically has a negative effect on CE. Further research is needed to understand the specific conditions under which TA may improve CE (Meuter et al., 2000; Roy et al., 2018). H5: Supported by the analysis, this hypothesis indicates a positive and significant relationship between TA and PV. This suggests that in certain contexts, technology anxiety may increase PV, perhaps by highlighting the perceived benefits of overcoming initial anxiety (Parasuraman & Colby, 2015). H6: The results support this hypothesis, suggesting that PV significantly influences CE. The results are consistent from previous studies that highlight the importance of PV in enhancing CE (Zeithaml, 1988; Sweeney & Soutar, 2001). H7: The analysis supports this hypothesis, suggesting that the interaction between TA and TI together enhances PV. H8: This hypothesis is not supported, indicating that the moderating effect of TA on the relationship between PV and CE is not significant. The results demonstrate significant pathways with varying strengths, emphasizing the complex interplay between the factors illustrated in Figure 2.

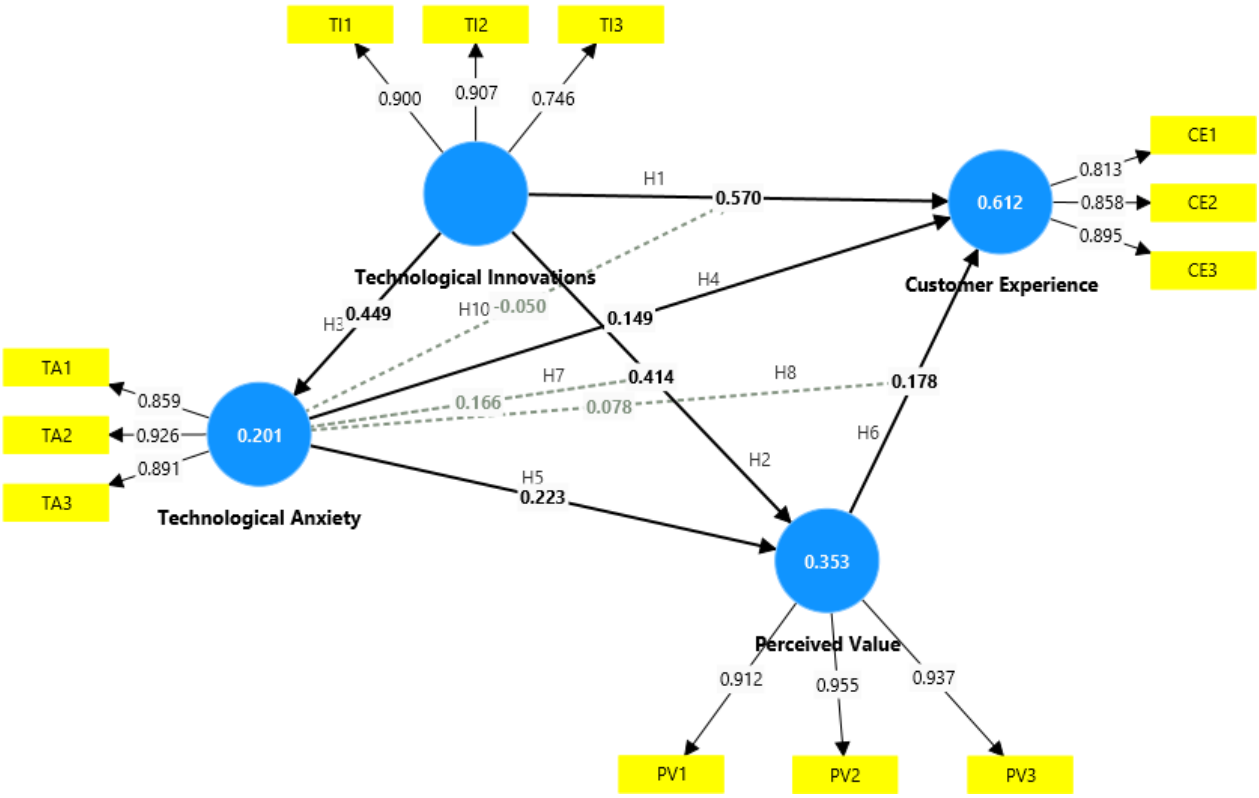

Figure 2. SEM Results

The path coefficients offer valuable insights into the relationships between TI, TA, PV and CE. The analysis reveals that TI positively impact both CE and PV, while also increasing TA. PV significantly enhances CE. The interaction effects between TA and PV, as well as between TA and TI, show varying levels of significance and impact on CE and PV.

The analysis provides strong support for most hypotheses, evidenced by significant path coefficients and low p-values. However, the direction of impact for H4 and H5 is contrary to initial expectations. This suggests that in this specific context, TA might have an unexpected positive effect, potentially highlighting perceived benefits or the positive aspects of overcoming technological challenges. Hypothesis H8 was not supported, indicating that the moderating effect of TA on the relationship between PV and CE is not significant, which could imply that the relationship between PV and CE is robust against varying levels of TA.

Specific Indirect Effects Results

In an SEM, specific indirect effects illustrate the impact from an independent variable on a dependent variable through one or more mediating variables (Preacher & Hayes, 2008; Zhao et al., 2010). For SEM results presented here, these indirect effects elucidate how TA and TI influence CE through PV. Table 7 details the specific indirect effects, providing sample original scores, means, standard deviations, T-statistics and P-values.

Table 7. Specific Indirect Effects Results.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
H9: TA -> PV -> CE	0.040	0.038	0.014	2.884	0.004
H10: TI -> TA -> CE	0.067	0.072	0.029	2.330	0.020
H11: TI -> TA -> PV -> CE	0.018	0.017	0.007	2.631	0.009
H12: TI -> PV -> CE	0.074	0.072	0.023	3.194	0.001
H13: TI -> TA -> PV	0.100	0.102	0.028	3.523	0.000
H14: TA x TI -> PV -> CE	0.030	0.029	0.012	2.533	0.011

H9: The analysis supports this hypothesis, indicating that PV mediates the link between TA and CE. This implies customers who overcome TA perceive a higher value in the service, which improves their overall experience (Parasuraman & Colby, 2015; Meuter et al., 2003). H10: The hypothesis is supported, showing TA mediates the link between TI and CE. This implies that while TI may initially cause anxiety, overcoming this anxiety may lead to improved CE (Meuter et al., 2003; Roy et al., 2018). H11: Results support this hypothesis, suggesting a multilevel mediation process in which TI affects CE through both TA and PV (Gretzel et al., 2015; Huang & Rust, 2017). H12: The hypothesis is confirmed, showing that PV mediates the relationship between TI and CE. The result is consistent with the existing literature, which emphasizes the significance of PV in increasing CS (Zeithaml, 1988; Sweeney & Soutar, 2001). H13: Supported by the analysis, this hypothesis indicates that TA mediates the relationship between TI and PV, suggesting that anxiety can emphasize the benefits of overcoming technological challenges (Meuter et al., 2003; Parasuraman & Colby, 2015). H14: Results confirm this hypothesis, showing that the interaction between TA and TI has a significant positive impact on perceived value (PV). While this interaction does not directly influence CE, it indirectly improves CE through its effect on PV. This indicates that the combined effect of TA and TI enhances PV, which in turn positively influences CE through an indirect pathway (Gretzel et al., 2015; Huang & Rust, 2017).

Discussion and conclusions

Discussion

The findings indicate that TI significantly enhance CE, which aligns with previous studies. For instance, advanced technologies like VR tours, mobile applications and automated booking systems contribute to increased convenience, personalization and interactivity, which, in turn, lead to higher CS. This is consistent with the findings of Bilgihan (2016) and Buhalis & Amaranggana (2015), who also observed that digital advancements improve CEs by enhancing the service delivery process.

Moreover, the current study supports the work of Gretzel et al. (2015) and Huang & Rust (2017), who emphasized that TI positively affect PV. Customers tend to perceive greater value in services incorporating advanced technologies, leading to better satisfaction and loyalty. This suggests that service providers should focus on highlighting the unique benefits of these technologies to improve PV and, consequently, customer loyalty.

However, an interesting and somewhat counterintuitive finding from this study is that TA positively influences both CE and PV, contradicting earlier expectations. Typically, TA is perceived as a barrier to positive customer outcomes (Roy et al., 2018), yet in this study, it appears that overcoming technological challenges can result in a greater appreciation of the service, aligning with the concept of eustress. This echoes the work of Meuter et al. (2003), who noted that technology-related stress, when effectively managed, can lead to positive outcomes by boosting engagement and satisfaction.

The study's findings regarding the mediating role of PV between TA and CE, as well as TI and CE, support the theory proposed by Zeithaml (1988) and Sweeney & Soutar (2001). This mediation underscores the importance of PV in enhancing CS. Previous studies have similarly argued that PV acts as a crucial mechanism in the relationship between service attributes and CS (Sweeney & Soutar, 2001). By emphasizing value-added services, companies can mitigate the negative effects of TA and amplify the positive impacts of TI.

In contrast, the positive influence of TA on CE and PV diverges from the findings of Roy et al. (2018), who suggested that TA typically hinders CE. The current study, however, shows that, under the right conditions, TA can enhance customer engagement and PV, especially when customers feel empowered to overcome technological challenges.

While this study reinforces much of the existing literature regarding the positive role of TI in enhancing CE and PV, it also offers new insights into the potential benefits of TA. These findings suggest that by providing supportive environments and user-friendly technology, service providers can turn potential anxieties into opportunities for greater customer appreciation and engagement.

Practical Implications

The increasing digitalization of leisure services has significant practical implications for both service providers and customers. Leveraging advanced technologies such as AI, AR and VR is transforming how businesses operate and engage with their customers, with a focus on enhancing personalization, operational efficiency and CS. The implementation of AI-driven tools and data analytics allows leisure service providers to personalize customer interactions at a deeper level. AI systems can analyze customer data to predict preferences and deliver tailor-made recommendations, ranging from customized vacation packages to preferred hotel amenities. For businesses, this means an opportunity to offer differentiated services that cater to individual customer preferences, increasing CS and loyalty. Personalization also extends to marketing efforts, where targeted advertisements and promotions can be crafted to align with customer behavior and demographics.

Digitalization enables businesses to streamline ope-

rations and reduce costs through automation. Chatbots, for example, provide 24/7 customer support, handling routine inquiries and bookings without the need for human intervention. This allows service providers to allocate resources more efficiently while ensuring that customers receive timely responses. Automated dynamic pricing algorithms can also adjust pricing in real-time based on demand, optimizing revenue while maintaining competitiveness in the market. Additionally, the implementation of self-service kiosks, mobile apps and digital check-ins further enhance operational efficiency by reducing wait times and providing more seamless CEs.

After all, service providers should continually invest in advanced technologies to enhance CE and PV. TI that offer greater convenience, personalization and interactivity can significantly improve CS. Providing adequate training, support and user-friendly interfaces is crucial to mitigate TA and maximize the benefits of TI. Ensuring that customers feel comfortable and confident using new technologies will enhance their overall experience. Highlighting the additional benefits that come with technological advancements can enhance customers' PV. Effective communication of these benefits will help service providers differentiate their offerings and increase CS.

Managerial Implications

Managers should prioritize investment in advanced technologies to improve service delivery. Allocating resources to adopt cutting-edge technologies that offer enhanced convenience, personalization and interactivity is crucial. Regular updates and maintenance of technological infrastructure are necessary to ensure seamless and efficient service delivery. Furthermore, monitoring emerging technology trends allows service providers to stay ahead of the competition and continuously enhance the CE.

Addressing TA is crucial to maximize the benefits of TI. Managers should provide comprehensive training programs and user-friendly guides to help customers become familiar with new technologies. Offering robust customer support through multiple channels, such as in-person, online and phone, assists customers who encounter difficulties. Designing intuitive and user-friendly interfaces minimizes complexity and enhances the usability of technological tools.

Highlighting the unique benefits of technological features can enhance PV and CS. Managers should clearly communicate the additional benefits and features that new technologies bring to the service. Using marketing and communication strategies to educate customers about how these technologies can improve their overall experience is essential. Developing personalized marketing campaigns that demonstrate the specific benefits of technological advancements to individual customer segments can further enhance PV.

A supportive environment can help customers overcome TA and maximize the PV of new technologies. Managers should foster a culture of innovation within the organization that encourages both employees and customers to embrace new technologies. Implementing feedback mechanisms to gather customer insights on their experiences with new technologies and address any concerns promptly is vital. Creating a welcoming atmosphere where customers feel comfortable experimenting with and learning about new technologies can further enhance PV and overall experience.

Integrating advanced technologies should ultimately aim to enhance the overall CE. Managers should ensure that all technological implementations align with the broader goal of improving CS and loyalty. Regularly assessing the impact of TI on CE and making necessary adjustments based on feedback and performance metrics is essential. Continuously innovating and refining service offerings to keep up with evolving customer expectations and technological advancements will help maintain high levels of CS.

By implementing these managerial implications, service providers in the leisure industry can leverage TI to enhance CE and PV while effectively managing TA. This strategic approach will help organizations create superior CEs, leading to increased satisfaction, loyalty and competitive advantage.

Conclusion

The results demonstrate that TI significantly enhance CE. Advanced technologies, such as VR tours, MA and automated booking systems, contribute to increased convenience, personalization and interactivity. This enhancement is critical for service providers aiming to differentiate themselves in a competitive market. By continuously investing in and integrating new technologies, service providers can meet and exceed customer expectations, fostering higher levels of satisfaction and loyalty.

An intriguing finding of this study is the positive impact of TA on both CE and PV. This counterintuitive result suggests that TA, when managed effectively, can enhance customers' appreciation of the service. Overcoming technological challenges may lead to a sense of accomplishment and increased PV. This finding highlights the importance for service providers to offer comprehensive training, user-friendly interfaces and robust customer support to help customers navigate and overcome TA.

PV plays a crucial mediating role in the relationships between TA and CE, as well as between TI and CE. This underscores the necessity for service providers to focus on delivering high-value services that enhance customers' perceived benefits. By emphasi-

zing the unique advantages and added value of technological features, service providers can mitigate the potential negative effects of TA and maximize the positive impact of TI on CE.

Looking ahead, businesses in the leisure sector must continue to innovate while being mindful of these challenges. Future-proofing strategies that incorporate emerging technologies, such as blockchain for secure transactions or even more immersive AR/VR experiences, will be key to staying competitive in an evolving market. Companies that successfully navigate this balance between innovation, CS and security will not only enhance their operational efficiency but also solidify their standing as leaders in the leisure industry.

Limitations and Future Research

The unexpected finding that TA positively impacts CE and PV warrants further investigation. Future research should explore the conditions under which TA might lead to positive outcomes and the potential mechanisms driving this effect. Additionally, the focus on leisure services limits the generalizability of the findings to other sectors. Future research could examine these relationships in different contexts to validate the results and provide broader insights.

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Data Availability

Data will be made available on request.

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