

# The Impact of the Characteristics of Self-Service Technologies on Customer Experience Quality: Insights for Airline Companies

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**Received:** 7 January 2024. **Revision received:** 29 March 2024. **Accepted:** 16 July 2024

## Abstract

Research on self-service technologies (SSTs) has not been fully developed, and it is still open to debate with many aspects concerning its effect on customer experience and potential outcomes empirically, especially in the airline industry. Studies regarding these technologies and their potential impact are needed in the airline industry as they represent an integral part of the tourism industry. Previous studies on the airline industry have merely focused on SSTs and their impact on customer adoption, tendency to use, and satisfaction. The SSTs have the capacity to influence how customers perceive their experience in the overall process of getting a service. Thus, customer experience quality (CXQ) is influenced by the perceived characteristics of SSTs. The literature on the impact of SSTs on CXQ is considerably limited in general, particularly in the airline industry. More research on this issue is needed, especially following the outbreak of COVID-19; thus, this study aims to investigate a model that integrates the impact of the perceived characteristics of SSTs as antecedents and outcomes of CXQ. The research design of this study is based on a mixed-method approach: a preliminary study consisting of two qualitative investigations and a main study through face-to-face questionnaires with airline passengers. Structural equation modeling (SEM) is applied to the data collected from passengers traveling with the airline company in Turkey (N=501) through questionnaires applied as mall intercepts. The results of this study include extending the CXQ dimensions to add consistency and institutionalism, hence contributing to the service and tourism literature. Furthermore, this research provides actionable insights for managers in airline businesses to invest more in SSTs to improve their CXQ, customer satisfaction, and positive word-of-mouth communication (WOM).

**Key Words:** Self-Service Technologies, Airline Passengers, Tourism Industry, Customer Experience Quality, Customer Satisfaction, Word of Mouth Communication, Structural Equation Modeling

**JEL Classification:** M31, L93, L80.

**Reference:** Duran, C., Uray, N., & Alkilani, S. (2024). The Impact of the Characteristics of Self-Service Technologies on Customer Experience Quality: Insights for Airline Companies. *Journal of Tourism and Services*, 15(29), 46–71. <https://doi.org/10.29036/jots.v15i29.735>

## 1. Introduction

The integration of innovative technologies in the airline industry has a significant potential to improve the understanding of passengers' responses and facilitate evidence-based decision-making in tourism and hospitality research (Alsharif et al., 2023a). In particular, by leveraging technologies such as self-service technologies (SSTs), companies are able to reshape the nature of customer interactions and

service delivery mechanisms. Notably, SSTs (i.e., mobile applications, websites, and automated customer service contact points) have been pervasively adopted in the service marketing field (Robertson et al., 2016). Businesses are intrigued by the advantages of these technologies, such as increasing the productivity and efficiency of services, decreasing labor costs, reaching new market segments, and thus establishing a competitive position in the marketplace (António and Rita, 2021; Nguyen et al., 2023; Shin and Perdue, 2019; Feng et al., 2019). Furthermore, SSTs have various advantages for customers, including convenience, faster services, saving time and money, and offering alternative choices (Marzocchi and Zammit, 2006; Sen et al., 2023), thus enabling them to make better decisions (Gummerus et al., 2019). In addition, these technologies allow customers to have more control over their service accomplishments and eliminate unnecessary interactions with service employees (Meuter et al., 2005; Shin and Dai, 2022). These merits of SSTs are sought to achieve high customer satisfaction, sustain loyalty, improve the perceived service quality of businesses, and create greater customer value (McWilliams et al., 2016; Fernandes and Pedroso, 2017; Ettis et al., 2023; Lahmayer et al., 2024), which ultimately results in enhancing customers' overall experiences.

Although the research on SSTs in the service marketing field is rich and evolving, its effects on customer experience (CX) remain a substantial challenge for both practitioners and scholars (Shiwen et al., 2021). In fact, the research on SSTs has not been fully developed, and it still attracts debatable viewpoints concerning their effectiveness (Safaeimanesh et al., 2021). For instance, on the one hand, some researchers suggest a positive impact of these technologies in increasing the efficiency, flexibility, convenience, and accessibility of services (Curran and Meuter, 2005; Choudhury and Karahanna, 2008; Sen et al., 2023). On the other hand, some argue that SSTs tend to decrease the personalization of services, eliminate social bonding between customers and firms, and can cause stress or confusion (Ba et al., 2010; Johnson, Woolridge, and Bell, 2021; Moore, Bulmer, and Elms 2022). Previous studies have mainly investigated the relationship between SSTs and innovation adoption, service use, and company performance (Liljander et al., 2006; Robertson et al., 2016). Within this group of studies, while empirical works on the acceptance of SSTs predominate the literature, there are relatively limited studies on post-usage outcomes. Although a few conflicting results have been reported (e.g., Johnson et al., 2008), the latter group of studies supports the direct positive relationship between SSTs and satisfaction as one of the most important post-usage outcomes (Robertson et al., 2016; Antwi et al., 2021).

Furthermore, many studies have addressed the role of SSTs in various industries, including retail, dining, hotels, healthcare, and banking (Wang et al., 2013; Lee and Yang, 2013; Giovanis et al., 2018; Lahmayer et al., 2024). However, research on SSTs within the airline industry is still an inevitable area to explore (Kasavana and Connolly, 2005; Batouei et al., 2020). Especially within the airline industry context, technological advancements have realized substantial changes in passenger engagement; incorporating SSTs has emerged as a fundamental strategy for enhancing operational efficiency and augmenting customer experiences. Within this context, understanding the intricate relationship between the characteristics of SSTs and the consequential quality of customer experiences becomes imperative for airline companies striving to navigate the complexities of modern consumer preferences and expectations.

Researchers highlight how the airline industry, once characterized by extensive reliance on traditional service models, has undergone a paradigm shift with the spread of SSTs. From online booking platforms to self-check-in kiosks and automated baggage drop-offs, passengers now encounter an array of technological interfaces throughout their journey. These SSTs provide passengers convenience, enabling them to personalize their travel experiences, expedite processes, and exert greater control over various touchpoints. Previous studies emphasize the role of these technologies in contributing to the tourist experience and tourism destinations by taking the role of a travel facilitator (Neuhofer et al., 2013; Kelly and Lawlor, 2018). However, alongside their potential advantages, the effectiveness of SSTs in shaping customer experiences hinges on the inherent characteristics embedded within these technologies. Hence, it is imperative to understand this relationship in order to allocate these technologies effectively. While prior studies addressed the implicit impact of these technologies on CX (Dong et al. 2015), the

literature still lacks a comprehensive understanding of the role of these technologies on CX, in general, CXQ in particular. Previous studies on the airline industry have merely focused on evaluating the use of SSTs and their adoption, tendency to use, and impact on customer satisfaction (e.g., Yen, 2005; Lee et al., 2012; Lien et al., 2021). As Alsharif et al. (2023a) pointed out, the literature also lacks a comprehensive understanding of CX in tourism, hospitality, and related literature. In addition, Liu and Hung (2022) called for studies to address the role of SSTs on CX in the hospitality and tourism literature. Thus, further research on the impact of these technologies on CX and CXQ within the airline industry is still needed (Antwi et al., 2021). Squeria et al. (2023) also emphasize that the impact of self-service technologies offers a promising avenue to help expand the understanding of the impact of technology on the airline travel experience; thus, the topic requires further study.

Accordingly, researchers have called to address the impact of SSTs on customers' overall experience quality and potential outcomes (Shin and Perdue, 2019). Therefore, this study aims to address this void by explicitly and empirically measuring the impact of these technologies on CXQ and also examining the effects of CXQ on customer satisfaction and word-of-mouth (WOM) communication as the post-usage outcomes. In particular, this research aims to address the following questions:

- How do the perceived characteristics of SSTs influence the perceived CXQ in airline services?
- What are the consequences of the perceived CXQ on airlines' market performance in the form of customers' post-usage outcomes?

By addressing these questions, this research contributes to extending the body of knowledge on SSTs, CXQ, and their interactions and offering managerial implications tailored to the specific context of the airline industry. In addition, this research advances the hospitality and tourism literature by understanding passengers' responses to integrating SSTs into airline services. This study endeavors to empower airline companies with actionable insights to foster enhanced service delivery and sustained competitive advantage in an increasingly digitalized marketplace. Also, this research offers insights for airline companies desiring to optimize their offerings of SSTs and improve their customer satisfaction levels.

The remainder of this article is structured as follows. First, a comprehensive literature review will be conducted by discussing the conceptual definitions of perceived SSTs, perceived CXQ, customer satisfaction, WOM, and their relationships in the airline industry. Next, a conceptual research model and hypotheses will be proposed. After that, the methodology of the study and the report of the study's findings will be presented. Then, the research's managerial and theoretical implications and limitations will be given, and future research directions will be discussed.

## 2. Literature review

### 2.1 SSTs for effective service management

As the basis of SSTs, information technology (IT) has provided value to customers in different forms, including low cost, experience, and/or innovation. Thus, SSTs represent the technological interfaces that give customers the independence to perform their needed services (Meuter et al., 2000). It enables customers to participate and engage directly in services without the need for personnel and service employees (Susskind and Curry, 2019). Unlike traditional service methods, incorporating SSTs provides faster, better quality, and more efficient services at a lower cost (Gummerus et al., 2019). By applying SSTs, companies can monitor and obtain customer behavior records; thus, a better understanding of customers' demands and maintenance of their satisfaction will be available (Johnson et al., 2008; Ganguli and Roy, 2011). With more technology integration in different forms of shopping and changes in today's customers' lifestyles and social dynamics, customers have begun to use SSTs more frequently than traditional channels. From the customers' perspective, they favor using SSTs to get their

services done instead of interacting with service personnel (Wang et al., 2016). This preference could be due to the definitive desire for innovative technologies in services (Lee et al., 2019) or a result of the coronavirus (COVID-19) pandemic that shifted customers' preferences in services to favoring non-interactive platforms (Seo and Lee, 2021; Zain et al., 2022). Thus, an increasing number of firms focusing on these preferences and needs have widely integrated SSTs into their operations to satisfy the expectations of their customers more effectively than their competitors and have a competitive advantage. Undoubtedly, today's competition, especially in the service industry, is more intense than ever. This is why SSTs started to invade various ranges of service industries, such as retail (Lee and Yang, 2013), hotels (Kasavana and Connolly, 2005), healthcare (Wang et al., 2013), banking (Giovanis et al., 2018), and airlines (Lee et al., 2012).

## 2.2 SSTs in the airline industry

The airline industry, which sells flights and provides services to transport people from one destination to another, significantly impacts tourism as it plays a critical role in transporting people worldwide (Zain et al., 2022). Due to the negative effect of the COVID-19 pandemic on the global airline industry, the industry has faced challenging times. Both during and after this period, one of the critical assets has been technology to increase marketing capabilities and directly contribute to the company's performance. Information technologies, social media, information technology-based tools/platforms, and advanced technologies (SSTs in particular) can also improve sustainable tourism management by enabling individuals to contribute to decision-making and planning (Streimikiene, 2023).

A recent report indicates that 92% of airport executives rank embedding advanced technologies, including SSTs, in the airline industry as their top priority for 2024 (The Magazine of Airport Council International, 2024). In addition, 60% acknowledged that not incorporating advanced technologies in the coming twelve months will pose a significant operational risk (The Magazine of Airport Council International, 2024). Therefore, it is inevitable for the top international airline companies to devote their effort to integrating SSTs into their operations and services more efficiently. Consequently, a recent study indicates an interest in understanding the possible implications and challenges that SSTs have in the airline industry (Moon and Lee, 2022). It is noteworthy that SSTs provide opportunities for companies in the airline industry, where the competition is highly intense on a global scale. SSTs are also sought to generate operational efficiencies and enhance tourists' experiences within the tourism industry (Gursoy, 2018; Kelly and Lawlor, 2018; Safaeimanesh et al., 2021; Seker et al., 2023). Thus, airline services, as an integral part of most tourism services, especially package tours, must offer customers a high-quality experience. With their high capital and technology investment structure, companies in the airline industry need to eliminate operational inefficiencies, such as high labor costs, turnover rates, and several people-based services, to succeed. The inefficacy of these and similar operations can be overcome by using SSTs. Airline companies benefit from SSTs for customer service, including airport check-ins, flight reservations, and self-help services such as airport information and/or navigation apps. Featuring SSTs in airline industries also allows customers and service providers to overcome the many significant challenges of air traffic, security, mistrust, inaccuracy, and misleading information (Thamaraiselvan et al., 2019; Lien et al., 2021). SSTs have also become essential to passengers' fully touchless journeys, from booking flights to checking in, obtaining answers to specific inquiries, boarding, and self-service bag drops (Thamaraiselvan et al., 2019). Some studies indicate that airlines save high costs per passenger with self-service check-in, and customers experience almost zero waiting times (Abdelaziz et al., 2010; Bogicevic et al., 2017). This is a valuable finding, as perceptions of long wait times harm passenger experience. Thus, the role of SSTs in the airline industry, as cited above, confirms that both the overall experience of the passenger and each touchpoint of the journey are influenced by SSTs.

Owing to the high demand for SSTs in the airline business context, researchers have conducted various studies to understand the impact of these technologies on customers' perceptions and behaviors. For instance, previous studies have identified the impact of SSTs on some factors such as acceptance,



intention to use, and customer satisfaction (e.g., Ku and Chen, 2013; Batouei et al., 2020; Cserdi and Kenesei, 2021; Antwi et al., 2021). No studies have addressed the direct impact of these technologies on either CX or CXQ. While some studies have implicitly addressed the impact of SSTs on passenger experience (Dong et al., 2015), research still needs to uncover an explicit understanding of the impact of SSTs on CXQ. Therefore, in this study, we draw on the airline industry to address the impact of SSTs on the CXQ, which in turn leads to customers' behavioral outcomes, including satisfaction and WOM.

### 2.3 CXQ: antecedents and outcomes

Arises from interactions between customers and certain offering-related stimuli, CX refers to customers' journey through their purchase process (Goudounaris and Sthapit, 2017). It represents both internal and subjective responses that customers form in any contact (i.e., direct or indirect) with firms (Meyer and Schwager, 2007). De Keyser et al. (2015) emphasize the nature of responses rather than the direction in defining CX and describe CX as the cognitive, emotional, physical, sensorial, and social responses recalled by a market actor(s); considering consumers' mental responses (cf. Alsharif et al., 2024). Furthermore, CX encompasses both the interaction with the business and the achievement of value made possible by the firm's product or service offering, which has been the most integral part of competitive differentiation (Suharto and Yuliansyah, 2023). Many academicians have sought CX as an effective aspect of competitive differentiation (e.g., Klaus and Maklan, 2012, 2013; De Keyser et al., 2015; Lemon and Verhoef, 2016). In particular, prior studies and their followers distinctly highlight how experiential marketing is the future of firms (Schmitt, 1999, 2003, 2010; Schmitt et al., 2015). Despite this construct has emerged as the core of management research because it achieves a substantial competitive advantage (McColl-Kennedy et al., 2015), the diverse conceptualizations of customer experience mean that its operationalization differs from study to study, creating measurement and validity concerns (Becker and Jaakkola, 2020). Furthermore, according to Schmitt et al. (2015), all service exchanges comprise a specific form of CX. The experience is particular to each customer; therefore, it is a personal experience with different levels of involvement: rational, emotional, sensorial, physical, and spiritual (Bueno et al., 2019). Notably, CX is multifaceted, and its research is considered to still be in its infancy (Lemon and Verhoef, 2016; Kuppelwieser and Klaus, 2021). Ideally, CX is measured before, during, and after a purchase (Klaus, 2014) and at all touchpoints (Lemon and Verhoef, 2016). The new technologies can transform the customer experience, and the assessment of this transformation needs to be investigated (Hoyer et al., 2020). Thus, SSTs have the capacity to influence how customers perceive their experience at each touchpoint or overall process of getting a service. Within this context, CXQ rather than CX is influenced by the characteristics of SSTs. For this reason, this research considers the concept of CXQ and how it is influenced by these advanced technologies.

### 3. CXQ

The airline industry is considered a more experience-based service industry (Laming and Mason, 2014). Thus, customer experience quality is more important for airline companies than service quality. Compared to service quality, CXQ is subjectively evaluated by considering both cognitive and emotional elements in the service provider-customer relationship before and after the service encounter(s) (Alnawas and Hemsley-Brown, 2019). However, providing services alone is never sufficiently sought to differentiate the provided services (Schembri and Sandberg, 2002). Hence, Klaus and Maklan (2007) have coined the value of CXQ by distinguishing the dimensions of both service quality and experience quality based on customers' behavioral intentions. The researchers argue that achieving CXQ provides customers with various emotional and functional benefits that tend to impact their behavioral intentions (Klaus and Maklan, 2007). This is because CXQ captures the holistic CX and all its phases, comprising both the direct and indirect interactions between customers and others during a service (De Keyser et

al., 2015). A recent study suggests CXQ emerges when customers interact with service providers based on the type of service providers, situation, and location, indicating its context-related nature (Kuppelwieser and Klaus, 2021). Therefore, this research contributes to the literature by examining the CXQ in the airline industry. This research follows the notion that focusing on CXQ is the ultimate predictor of customers' behavioral intentions (e.g., Maklan and Klaus, 2011; Klaus, 2014; Lemon and Verhoef, 2016). Consequently, this study integrates the CXQ construct into a nomological network of antecedents and consequences to better judge customer behavioral intentions in the airline industry.

### 3.1 SSTs and CXQ

As emphasized before, in air travel, SSTs have become an inseparable component of travelers' journeys, starting from information search to check-in. Previous studies suggest that incorporating SSTs into service provision could improve CX (Considine and Cormican, 2016). An airline company's worthy CX can be conveyed by incorporating SSTs (Considine and Cormican, 2016). This can be manifested by using these technologies to direct, enable, and support customers' value-creating means (Akersson et al., 2014). As Neuhofer (2016) points out, customer participation facilitated by these technologies also influences the tourism experience by creating value for customers. For instance, it allows customers to perform their needed services conveniently (Meuter et al., 2000; Meuter et al., 2003). In addition, SSTs have become essential to customers' fully touchless journeys in most service processes. Today's customers may face and use SSTs at almost every stage of the service process, such as self-giving orders, buying tickets, and obtaining answers to specific inquiries. The integration of SSTs in service settings makes customers wait for less time in service provision, get similar services on each occasion, and enables service providers to decrease the cost per customer. Thus, the integration of SSTs with the service process offers valuable benefits to the customers. Customers notably appreciate these benefits provided by SSTs as they improve their perceptions of experience quality (Akersson et al., 2014). Therefore, we hypothesize as follows:

**H1.** Airline companies' perceived characteristics of SSTs have direct effects on CXQ.

### 3.2 CXQ and customer behavioural outcomes

#### 3.2.1 Customer satisfaction

Customer satisfaction is generally manifested through a series of positive customer experiences (Meyer and Schwager, 2007). Extant research indicates that CXQ tends to stimulate customer satisfaction levels (e.g., Klaus and Maklan, 2013; Kusumawati and Rahayu, 2020). This relationship can be explained through the theory of planned behavior (cf. Ajzen, 1991), which postulates that customers' cognitive assessment of certain contact episodes (i.e., experience quality of SSTs) impacts customers' attitude (i.e., satisfaction with the service). Some researchers specifically emphasize that certain characteristics of SSTs, such as functionality and customizability, influence customers with a positive emotional response, resulting in approach behavior, including satisfaction (Ahn and Seo, 2018). The functional utility of SSTs has been demonstrated in airport environments (Kim and Park, 2019). In fact, CX creation entails various independent contact points throughout the process, causing affective, social, cognitive, and physical responses (Verhoef et al., 2009). These customer experiences, whether good (pleasurable) or bad (unpleasurable), generate customer responses (positive or negative) concerning satisfaction, quality, purchase intention, value, loyalty, recommendations, and patronage. Consequently, Rajnish et al. (2017) indicate that experiential memories are relatively more stable and frequently reinforce positive or negative responses toward firms or services, resulting in approach or avoidance behaviors. The effect of CX has already been found to have positive consequences, such as customer satisfaction (Klaus and Maklan, 2013; Roy et al., 2017; McLean et al., 2018). Of particular note, Park et al. (2020) showed how the service quality of airline service experience could contribute to passenger satisfaction. Antwi et al. (2021) also

suggest the advantages of SSTs, such as reducing costs and waiting time to drive passenger satisfaction. From this H2 flows:

**H2.** The CXQ of an airline company has a positive direct effect on passenger satisfaction.

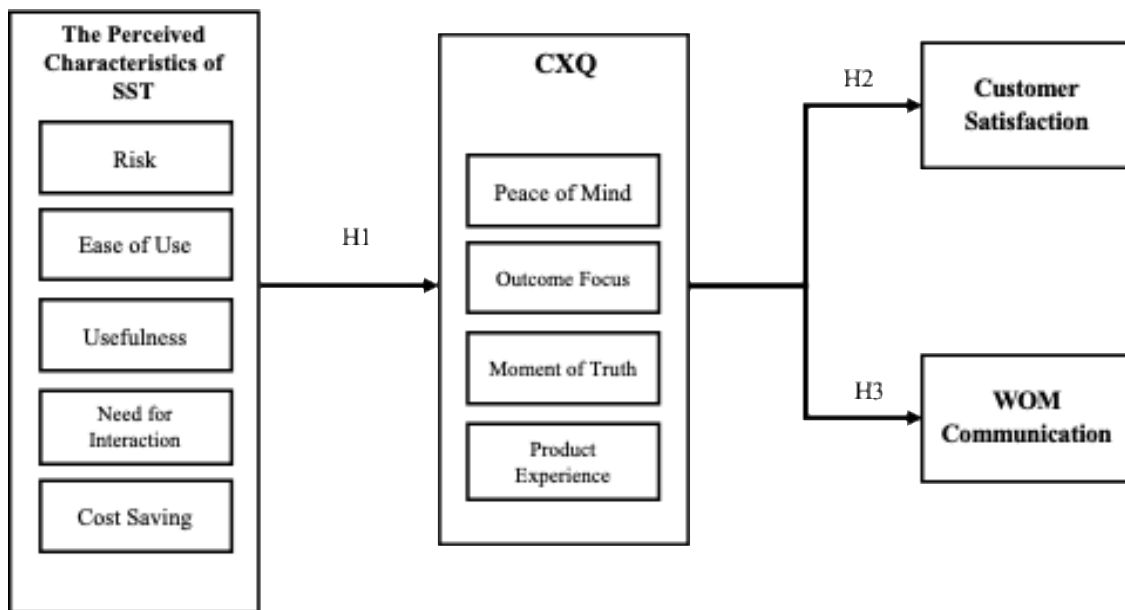
**3.2.2 WOM**

Notably, CXQ drives not only customer satisfaction but also WOM communication. The impact of CX in generating WOM communication has been widely discussed in the literature (e.g., Cetin and Dincer, 2013; Andajani et al., 2014). Accordingly, this study suggests that the CXQ of an airline company facilitates positive WOM communication. According to Lien et al. (2018), WOM refers to people’s informal communication about specific products or services with others. This informal communication about companies, products, and services affects other customers’ perceptions, attitudes, and decisions. Customers who have had a pleasant experience in a firm or product/service feel good about the company or product/service and reflect an approach in the same direction. One approach is positive communication about the company, product, or service with the consumer’s social environment in an offline and online setting. Here, positive WOM communication denotes the extent to which customers praise the company or product to others (Brown et al., 2005). As customers tend to adopt technology and have a positive mood due to positive experiences, they are willing to engage in WOM (e.g., Lien et al., 2018). Prior studies emphasized the role of creating CX to exploit pleasant aspects such as WOM (Velooso and Gomez-Suarez, 2023). In addition, previous studies have demonstrated the positive influence of the CXQ of a service provider on customers’ propensity to spread positive WOM about that service provider (e.g., Klaus and Maklan, 2013). Thus, H3 is developed as follows:

**H3.** The CXQ of an airline generates positive WOM communication about the airline company.

**4. Conceptual model**

Graph 1. Conceptual model



Source: own model

The theory of planned behavior (Ajzen, 1991) postulates that customers' cognitive assessment of certain contact episodes (i.e., experience quality of SSTs) impacts their attitudes (i.e., satisfaction with the service). Fishbein and Ajzen (1975) identify attitude as an individual's feeling of favorableness or non-favorableness toward particular objects or stimuli. In addition, attitude is manifested as enduring characteristics, including satisfaction (e.g., Iqbal et al., 2018) and customers' behavioral intentions, such as WOM communication (e.g., Klaus and Maklan, 2013). Following this line of reasoning, as depicted in Graph 1, this study expects that customers' experience of using the SSTs of certain entities will impact their satisfaction, as well as drive WOM communication toward that entity. The following section articulates the research hypotheses regarding the relationships between the perceived characteristics of SSTs, perceived CXQ, customer satisfaction, and WOM.

Based on the previous argument and grounded in the theory of planned behavior, this study proposes the following conceptual model.

## 5. Methodology

### 5.1 Research design

This research employs a mixed-method approach (i.e., qualitative and quantitative) in order to generate detailed insights and gain a better understanding (Tashakkori and Creswell, 2007). This approach was chosen because the understanding of the interaction between SSTs and CXQ is limited in the airline industry, as well as due to the call of previous studies to incorporate a qualitative approach when studying CX in order to identify potential and more context-specific items (Klaus and Maklan, 2013; Imhof and Klaus, 2019). Due to the lack of empirical studies on CX in general and CXQ in particular in the literature, exploration of both the perceived dimensions of these concepts and the perceived attributes of SSTs in airline services by passengers would shed light on the model of our study. Toward this end, the research design of this study is based on two stages: a preliminary phase and the main study. The preliminary stage consists of semi-structured interviews with CX managers and focus groups with airline passengers. The semi-structured interviews with CX managers of companies that are pioneers in implementing CX management in their organizations were due to the idea that this type of interviews enabled us to acquire more in-depth information and evidence from informants while considering the core and the focus on our research. The service users' perspectives were found necessary in addition to the airline service provider's perspective. After completing the preliminary stage, we re-evaluated the conceptual model and implemented the main study, which consisted of descriptive research through face-to-face questionnaires with airline passengers.

### 5.2 Preliminary study

#### 5.2.1 Perceptions and experiences of an airline company's unit: In-depth interviews

Due to the fact that there are only four managers dealing with the airline company's customer experience. Four in-depth interviews (semi-structured) were conducted with the CX manager and related staff of Turkey's most competitive national flag carrier airline company that pioneered establishing a CX management system in Turkey. The airline company began its first overseas flight from Istanbul to Athens in 1947. In 1951, the number of destinations increased as the number of fleets increased to almost 33 aircraft. Today, the company conducts flights to 120 countries from Istanbul, Turkey, with a young fleet of 396 aircraft.

This study aims to understand the impact of SSTs on each touchpoint of the company's customer journey, the characteristics of SSTs that influence CXQ, and the dimensions of the CXQ from the managers' perspective. For this reason, semi-structured, in-depth interviews were conducted purposefully



with the unit managers responsible for the company's CX. The reason for choosing semi-structured interviews is to enable us to acquire more detailed information and evidence from practitioners while considering the focus of the research (Alsharif et al., 2023b). Accordingly, the interview guide included seven open-ended questions were developed, and four semi-structured interviews were conducted. Each interview lasted almost 45 minutes. These interviews were recorded and then transcribed by two researchers who individually coded the responses categorized them, and labeled each text category to represent the perspectives of the interviewed managers. The coding process was performed by the researchers manually using spreadsheet software. Both researchers reviewed and compared their notes and made the necessary modifications to determine the themes that captured the main aspects discussed in the interviews.

The findings of these interviews show how the CX department at the company has been established to gather experience-related issues, which are the responsibility of different departments under a single roof in the initial stage. Before establishing the CX department, the airline company received a consultancy service from a globally well-known marketing academic on the topic and prepared a CX map. The interviews with the customer experience manager and his staff revealed that the company contacted customers at 64 points throughout the entire journey. These touchpoints are grouped according to three different priority levels and five main sections such as “Planning the Journey,” “Departure to the Journey,” “Flight,” “Arrival,” and “Continue Communication.” CX was measured using a separate set of questions at all these points. This is not done in any period but when a new product and service are developed or when an error is detected. The questioning process for all points has not been finalized. Strategies to increase these will be developed in the next period, according to the scores obtained at all points. The results obtained from the interviews indicate that although the company spends a lot of time and effort to understand and increase the CX of their passengers as a whole, they approach the topic of CX management by dividing the airline experience of customers into six categories: planning to travel, going on a journey, flying, arriving, maintaining communication, and determining the touchpoints. Thus, an airline company approaches the topic of CX by designing a CX map and meeting the passengers' expectations at each touchpoint.

They do not seem to focus on the role of SSTs on CX or CXQ specifically in their operations. However, the managers agree that the main characteristics of SSTs, including ease of use, cost savings, efficacy, and control, are essential for the consumers and influence their perceptions of CXQ. They also believe that CX cannot be measured using a single rather than multiple metrics. Although the company has not developed an integrated measure for CX, for most of the dimensions of CX, similar to those cited in the literature, CX should be measured based on those dimensions by the managers. However, “consistency in the whole service” as one of these dimensions has gained attention owing to its differences from those in the literature.

### 5.2.2 Perceptions of the passengers: focus groups

Two mini-focus groups were conducted, each consisting of four passengers who had traveled by airline using SSTs over the past six months. This timeframe is chosen to make sure that respondents can vividly recall all aspects of their experiences with SSTs during their recent travel. By focusing on their recent travel, the research aims to capture fresh and detailed recollections from respondents, which is essential for identifying the nuances of their experiences, emotions, and behaviors. Furthermore, due to the lack of studies on CXQ in airline services, the mini-focus group was preferred to probe the perceptions and thoughts of the customers, how they define the whole experience with the airline, and the main characteristics of a high-quality experience with airline services. Given that the optimal size for a mini-focus group is typically 4-5 respondents, our study included four respondents to ensure meaningful and manageable results.

The two focus groups are separated according to age category, and both include an equal number of male and female passengers. The focus group discussions include questions to understand how

passengers define their whole experience with airline travel, the essential characteristics of this experience, and how they perceive the role of SSTs in the different aspects of their experience with the airline. Each group discussion lasted almost 75 minutes. Two researchers transcribed and coded the data generated from these focus groups. The essential characteristics or dimensions of the CX mentioned by the participants were combined, and a list was developed. This study is mainly grounded in the dimensions and measurements of CXQ in Maklan and Klaus (2011). However, one of the aims of this qualitative phase was to understand whether additional dimensions or variables of CXQ perceived by the customers could be explored or available. The participants in the focus groups suggested several items that explained the different aspects of their experiences with the airline. Among these statements, several ones commonly emphasized implied different dimensions from the literature. These statements are presented as follows:

“The treats of X airline are very nice on every flight, even every time.”

“Airline X's planes usually leave on time.”

“The service quality at Airline X is the same on every flight.”

“It is important to me that Airline X is an institutionalized company.”

These statements were found to be two dimensions different from those of the CXQ construct in Maklan and Klaus (2011). “Consistency,” as one of these dimensions, was similar to the suggestion and perception of airline company managers about the CXQ dimension. “Consistency” captures the company’s reliability and ability to deliver the same quality of services to its customers over time. The other dimension was “institutionalism,” which refers to the company's structure, implying the degree of formalization in procedures and processes. Of particular note, although these two factors are distinct, yet, they are interrelated. The study's findings concluded that the degree of ‘institutionalism’ is interpreted by customers as a demand for consistency. Due to this, the effects of these two factors could be seen in unison. Therefore, the four new items are under the variable ‘consistency.’

### 5.3 Main study

#### 5.3.1 Data collection and sample

The study’s model was tested based on data collected from a questionnaire of passengers who traveled in the last six months through mall intercept. The respondents were randomly approached in the mall and were solicited to participate in the study. They were first qualified to ensure that they had traveled in the last six months. Data were collected on all days of the week at all times, as the questionnaire was administered by graduate marketing students. Through the mall intercept approach, a total of 530 questionnaires were completed face-to-face. After eliminating questionnaires with conflicting responses and those with incomplete data during the cleaning data process, a total of 501 valid questionnaires remained. The majority of the respondents were between the ages of 25 and 35. Female respondents represent 82% of the sample, indicating a higher frequency compared to male respondents. This disparity can be attributed to the mall intercept method employed in the research, which may have increased the likelihood of encountering females willing to participate in the study. Additionally, it is important to consider the significant increase in working women in Turkey, which likely contributed to the higher proportion of female respondents. The respondents’ other socio-demographics and travel-related attributes are summarized in Table 1.

Table 1. Sample demographics (N=501)

Respondents' Demographics	Frequency	%
<b>Gender</b>		
Female	413	82.4%
Male	88	17.6%
<b>Educational level</b>		
Primary School	100	20%
High/Technical School	228	45.5%
College/Undergraduate	135	26.9%
Masters+	38	7.6%
<b>Age</b>	Average: 31	S.D: 11,661
<b>Employment</b>		
Employed	326	65.1%
Unemployed	175	34.9%
<b>Travel Purpose</b>		
Business	150	29.97%
Leisure or Visit Friends/Family	351	70.1%
<b>Travel Frequency</b>		
Monthly or More Frequently	37	7%
Every six months – 2 months	416	83%
Annually or less than a year	48	9.6%

Source: own research

### 5.3.2 The variables and measures

The respondents were first asked to confirm that they had traveled with the same airline company in Turkey over the past six months. The study also considered seasonal effects, and data was collected from February to August. The scales used to measure all the variables in the study were translated into the local language and then re-translated into English. After a cross-check and corrections were made, two marketing professors checked the final statements, which were tested in a pilot study in the local language and finalized for the current study. All scale items were measured using a five-point Likert scale ranging from “1 – Strongly disagree” to “5 – Strongly agree.” The five-end-point scale is considered because it reduces the frustration levels of respondents and increases the response rate (Sachdev and Verma, 2004). Besides, prior studies found it more appropriate for European surveys (Bouranta et al., 2009; Aristos et al., 2018; Safaeimanesh et al., 2021).

Seventeen items were adopted from Curran and Meuter (2005) to measure the SSTs. Nineteen items were adapted from Klaus and Makalan (2012/2013) and used to measure the perceived CXQ. In addition, four items were added to measure/capture “consistency” and “institutionalization,” the two added variables based on the in-depth interviews and focus group results. Five items are adapted from Oliver (1997) to measure customer satisfaction. Furthermore, WOM communication was measured using seven items adapted from Brown et al. (2005). Finally, demographic and travel-related questions (gender, age, education level, travel purpose, travel frequency, and flight type) were also included in the questionnaires.

Table 2. Variables in the Study

Variables	Scale	Source
<b>Perceived Characteristics of SSTs</b> - Ease of Use - Usefulness - Cost saving -Need for Interaction -Risk	5-point Likert Scale  (17 items)	Adapted from;  Curran and Meuter (2005)  Meuter <i>et al.</i> (2000)  Yang and Jun (2002)
<b>Customer Experience Quality</b> - Expertise - Process ease -Relationship vs. transaction -Convenience retention -Familiarity -Independent advice -Inertia -Result focus -Past Experience -Common grounding -Flexibility -Proactivity -Risk perception -Interpersonal skills -Service recovery -Freedom of choice -Cross-product comparison -Comparison necessity -Account management	5-point Likert Scale  (19 items)	Maklan and Klaus (2011)
<b>-“consistency”</b> <b>-“Institutionalism”</b>	5-point Likert Scale (4 items)	Based on the insights obtained from qualitative Research
<b>Customer Satisfaction</b>	5-point Likert Scale (5 items)	Oliver (1997)
<b>WOM</b>	5-point Likert Scale (7 items)	Brown <i>et al.</i> (2005)

Source: own research

### 5.3.3 Common method bias

Because of the self-reported data obtained primarily from survey methods, such as this study, common method variance is a potential problem that should be controlled. Podsakoff et al. (2003) recommend specific statistical procedures to control for common method variance in different research settings. Based on these recommendations, and because of the similarity between situation seven,



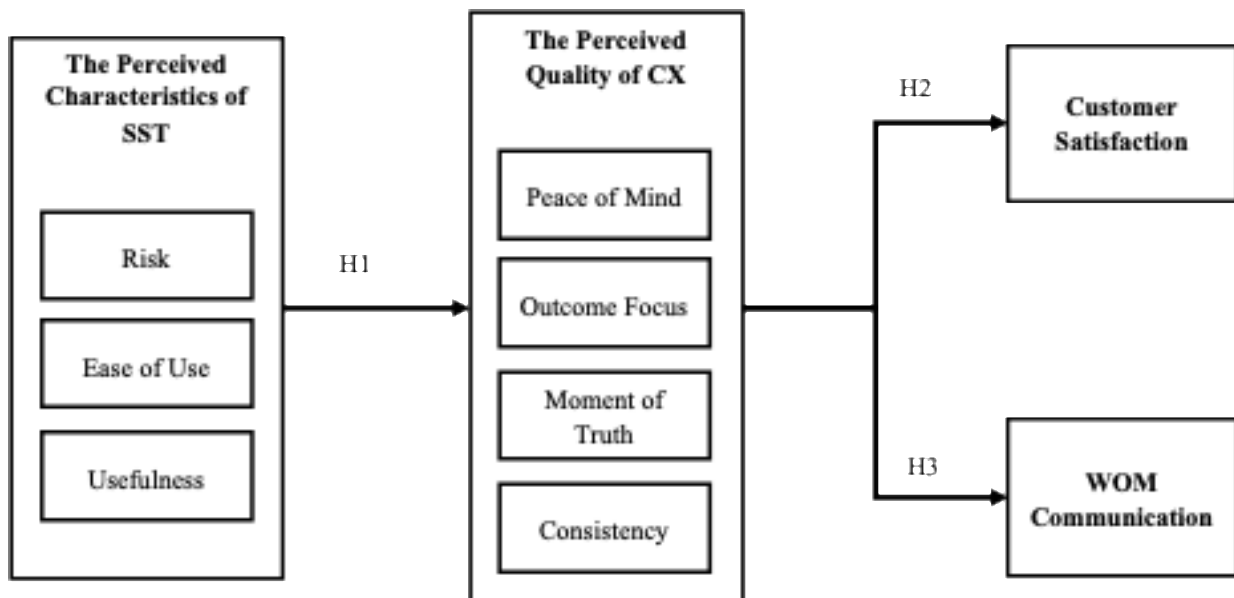
described by Podsakoff et al. (2003), and the attributes of the methodology of this study, the use of a single-common-method-factor approach is preferred. Thus, a Harmon one-factor test (Podsakoff and Organ, 1986) was conducted by loading all the variables in the model into an exploratory factor analysis (EFA) to examine the unrotated factor solution to determine the number of factors. The unrotated factor solution of 52 items revealed 11 dimensions. Factor analysis is repeated by extracting only a single factor, which is found to explain only 23% of the total variance. These results confirm that there is no evidence of common method bias in this study.

## 6. Findings

### 6.1 Measurement model: psychometric properties

The scale used in the study was purified using EFA. The results of the EFA were evaluated in conjunction with the results of the scale reliability analysis using item-total correlations and Cronbach’s alpha. During the analysis process, several items with low loadings were eliminated, some variables were dropped owing to insignificance, and some modifications were made to the model. Three different EFAs were conducted. The first-factor analysis was performed on the perceived characteristics of the SSTs variable, where four factors were obtained, including 15 items with loadings greater than 0.513, reaching an accumulated variance explained of 62.30% (KMO:0.93, Bartlett test:3629.67, df=105, p<0.001). The second screen plot displays a factoring of 22 items with loadings higher than 0.493 in 6 dimensions for the CXQ, with the accumulated variance explained reaching 61.76% (KMO:0.938, Bartlett test:6621.640, df=253, p<0.001). Finally, the outcome variables were summarized into two factors, namely, “SATISFACTION” and “WOM.” The accumulated variance explained reached 71.5% (KMO:0.94, Bartlett test:4209.1, df=55, p<0.001). Accordingly, the remaining items of the scale score an item-total correlation of at least 0.700, and a Cronbach’s alpha factor of at least 0.843 supports the reliability and validity of the scale. The updated model, as presented in Graph 2, is considered in the final data analysis part of the study.

Graph 2. Revised conceptual model



Source: own model

AMOS 27 was used to perform a confirmatory factor analysis on the updated 48-item measurement model. The resulting measurement model displays acceptable goodness-of-fit for the data, as indicated by  $\chi^2(1083) = 3,751.2, p < .001; \chi^2/df = 3.47; CFI = .89; NFI = .95; GFI = .95; RMSEA = .070$  confidence interval [.068;.073]). Table 3 summarizes the results of the measurement model.

Table 3. AMOS results for the measurement model (N=501)

Constructs and measurement items	$\lambda^a$	CA	CR	AVE
<b>Ease of use</b>		<b>0.823</b>	<b>0.980</b>	<b>0.534</b>
- Learning to use the SSTs was easy for me	0.685			
- I find the SSTs easy to use	0.772			
- It was easy for me to become skillful at using the SSTs	0.658			
- Channels of SSTs are the easiest way for me to perform my needed service	0.773			
- Using SSTs allows me to perform the service I want without losing time	0.598			
<b>Usefulness</b>		<b>0.822</b>	<b>0.950</b>	<b>0.442</b>
- Using the SSTs improves the way in which I perform the needed service	0.741			
- Using the SSTs makes doing the service more affordable	0.786			
- Using SSTs enabled me to manage my travel expenses efficiently	0.758			
- Using SSTs saves me time	0.513			
<b>Risk</b>		<b>0.843</b>	<b>0.970</b>	<b>0.534</b>
-I feel secure while conducting my airline-related services using SSTs	0.738			
-I feel safe while using the SSTs to do my needed services	0.702			
-I know that the SSTs will process my requirements correctly	0.671			
-There is no chance of something going wrong when I use SSTs	0.750			
-Using SSTs is pleasant to me, as it offers additional information	0.533			
-Using SSTs made it easy for me to plan	0.615			
<b>Peace of mind</b>		<b>0.859</b>	<b>0.950</b>	<b>0.784</b>
- I'm confident in their expertise, as they do the job very well	0.777			
- Have good interpersonal skills	0.497			
- This company keeps me informed of new developments and information about the services	0.501			
- This company gives me the same attention on all my purchases	0.708			

- It's easy to follow the offers of this company	0.493			
- The whole process was so easy	0.789			
<b>Moments-of-truth</b>		<b>0.823</b>	<b>0.980</b>	<b>0.587</b>
- Was flexible in dealing with me and looked out for my needs.	0.573			
- This company will offer me alternative options that suit my needs	0.582			
- In case of any error, I know that the company will fix it	0.617			
- I need to choose between options at this company	0.784			
- I need to compare different options from it	0.681			
- I have one designated contact at this company	0.545			
- This company give(s) independent advice	0.507			
- I stay with this company because of my past dealings with it	0.518			
-This company provides convenient offers for me	0.518			
<b>Outcome focus</b>		<b>0.820</b>	<b>0.940</b>	<b>0.855</b>
- Staying with it makes the process much easier	0.691			
- I prefer it because I don't trust the other alternatives	0.839			
- I prefer it over an alternative provider without comparing	0.882			
<b>Consistency</b>		<b>0.876</b>	<b>0.970</b>	<b>0.474</b>
-This airline company's services on flights are very good every time.	0.733			
-The flights of this airline are usually on time	0.800			
-The service quality of this airline is the same on every flight	0.789			
-It's very important for me for this airline company to be an institutional one	0.602			
<b>Customer satisfaction</b>		<b>0.905</b>	<b>0.96</b>	<b>0.456</b>
-My feelings towards it are very positive	0.726			
-Say positive things about this company to other people	0.758			
-Overall, I'm satisfied with this company and the services they provide	0.769			
-I feel satisfied that this company produces the best results that can be achieved for me	0.746			
-The extent to which this company has produced the best possible outcome for me is satisfying	0.731			

-I feel good about choosing this company for the offerings I'm looking for	removed item			
<b>WOM</b>		<b>0.935</b>	<b>0.97</b>	<b>0.567</b>
-Mentioned to others that you purchase services from it	0.730			
-Made sure that others knew that you purchased their services	0.700			
-Spoke positively of it to others	0.772			
-Recommended to acquaintances	0.817			
-Recommended it to close personal friends	0.808			
-Encourage friends and relatives to use it	0.752			
-Use it more in the next few years	Removed item			
<sup>a</sup> All factor loadings were significant at $P < .001$ CA stands for Cronbach's Alpha; CR stands for Composite Reliability; AVE stands for Average Variance Extracted * The Cronbach of alpha for the cost saving is not available due to items elimination, as it has only 2 items left.				

Source: own research

The results support the internal consistency of all scales used as Cronbach's alpha, and the composite reliability is greater than 0.70 for all scales. Each of the 48 indicators loads significantly on its respective construct, with factor loadings ranging from 0.54 to 0.79, thereby supporting the convergent validity (Fornell and Larcker, 1981). The variance extracted for all the constructs falls within the accepted value of 0.40 (Fornell and Larcker, 1981). Moreover, the variance extracted for each construct is higher than the squared inter-factor correlations, thus supporting the discriminant validity.

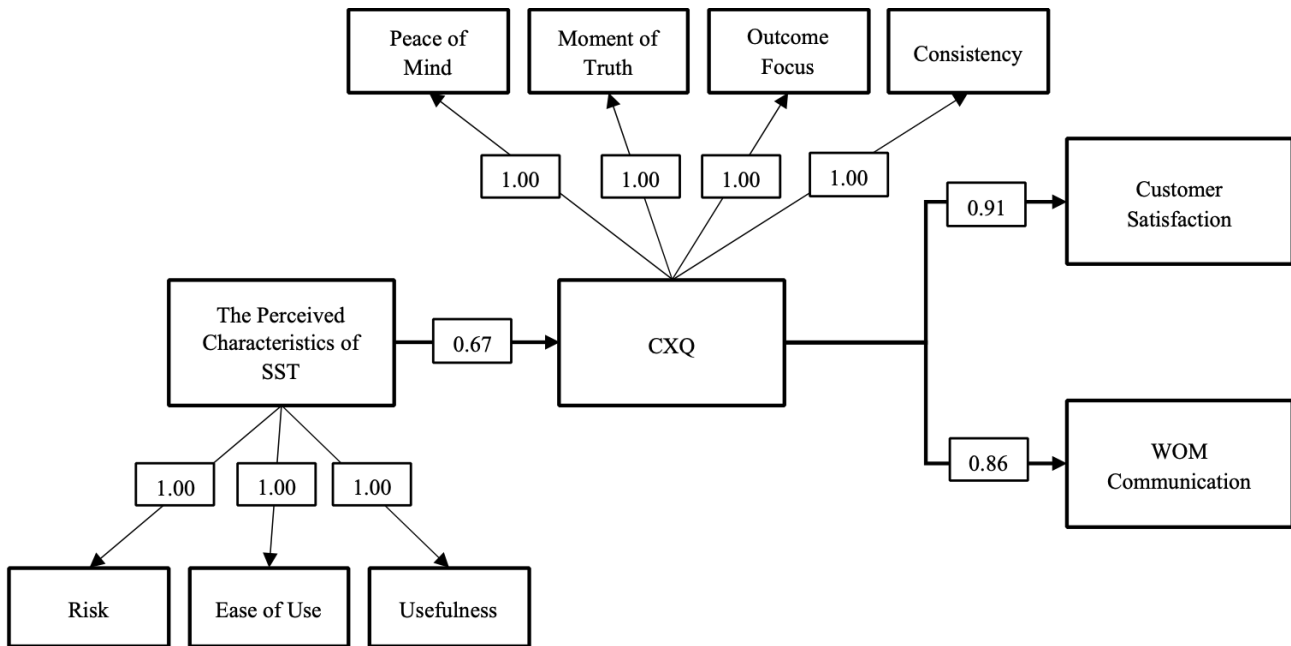
### 6.2 Structural Model Assessment and Hypothesis Testing

A structural equation model was estimated using AMOS 27. The results of the estimated model are presented in Graph 3. The results indicated an acceptable fit model:  $\chi^2(1078) = 3,796.7, p < .001; \chi^2/df = 3.52; CFI = .92; NFI = .95; GFI = .92; RMSEA = .071$  confidence interval [.069;.073].

All three hypothesized relationships were supported. Table 4 summarizes the results of the hypothesized model. In particular, the perceived characteristics of SSTs are found to have a significant impact on CXQ (0.67), thus supporting H1. This finding is in line with Considine and Cormican's (2016) outcomes that support the impact of SSTs on improving overall CX. Furthermore, CXQ has been found to significantly impact both customer satisfaction (0.91) and WOM communication (0.86), hence supporting H2 and H3. The results of H2 are in line with Roy et al.'s (2017) finding that employing smart SSTs can enhance CXQ, thereby leading to better customer satisfaction. Finally, these findings align with previous studies conducted in different industries, highlighting the positive impact of CXQ on customer satisfaction and generating customers' behavioral outcomes of spreading positive WOM. (e.g., Klaus and Maklan, 2013; Andajani et al., 2014).



Graph 3. SEM estimated using AMOS27



Source: own research

Table 4. AMOS SEM results for the hypothesized model

	Path	Estimate	t-value	p-value	Results
H1	The Perceived Characteristics of SSTs → CXQ	0.67	10,744	.000*	Supported
H2	CXQ → Customer Satisfaction	0.91	14.807	.000*	Supported
H3	CXQ → WOM Communication	0.86	15.214	.000*	Supported

\* P < .001

Source: own research

## 7. Discussion and Implications

The airline industry applies SSTs to eradicate the direct interaction of passengers with service employees and enhance their CX by granting them independence in performing services (Meuter et al., 2000; Susskind and Curry, 2019). Given that the recent COVID-19 pandemic has considerably shifted customers’ consumption habits to a more asocial nature (Seo and Lee, 2021; Moon et al., 2021; Zain et al., 2022), the airline industry has an obligation to provide automated services such as SSTs to manage their CXQ. These technologies, including mobile applications, websites, and automated customer service contact points, have differentiated CX and changed the value offered to customers. Understanding the impact of these technologies on CXQ is vital if the provider demands to not only retain its customers but also attract new ones (e.g., Rayport and Jaworski, 2005; Akesson et al., 2014). Therefore, this study

aimed to comprehend further the relationship between the perceived attributes of SSTs and CXQ and their outcomes.

In addition, the results of this research are in line with previous studies that highlighted the need for airlines to enhance their competitive market strategy through technology to establish good relationships with passengers and increase their loyalty (Chang and Ku, 2023). The findings of this research emphasize the significant impacts of characteristics of SSTs on CXQ within the airline industry. Specifically, identifying risk as a key determinant highlights the importance of mitigating uncertainties associated with using SSTs to enhance customer satisfaction and foster positive WOM. Furthermore, the emphasis on ease of use and usefulness reveals the critical role of instinctive design and functional utility in facilitating seamless interactions and prompting favorable outcomes for passengers. In addition, the outlining of CXQ characteristics, including peace of mind, consistency, a moment of truth, and outcome focus, underlines the multifaceted nature of customer experience within the airline industry. By revealing the dimensions through which SSTs shape these quality attributes, this research offers actionable insights for airline companies seeking to optimize the offering of SSTs and promote customer satisfaction levels.

In addition, the findings of this research confirmed the previous research of Iqbal et al. (2018) and provided further support for the positive impact of SSTs on CXQ. Furthermore, this study theoretically contributes to the literature by extending the dimensions of CXQ about SSTs by integrating two additional dimensions, namely, consistency and institutionalism. Based on this contribution, it can be concluded that the continuity and consistency of the offered services and the considerations of social and institutional norms are equally important when it comes to applying and evaluating SSTs in the airline industry. This suggests that both consistency and institutionalization represent important areas to understand and consider when studying the airline industry. In fact, the results of this study indicated that these two additional factors are different but interrelated. "Institutionalism," referring to the company's structure, implies that the degree of formalization in procedures and processes might be seen as the requirement of consistency by the customers at the same time. For this reason, the effects of these two variables can be observed in the same direction. This research also demonstrates the impact of various attributes of SSTs, including ease of use, usefulness, and perceived risk, on the CXQ of the provided service, which determines their overall satisfaction and WOM communication. Of particular note is that the findings from this research suggest the role that SSTs play in enhancing customers' touristic experiences, given that the majority of passengers in this study were traveling for leisure.

The findings further provide managerial direction for practitioners in the context of the airline business. Notably, CXQ is essential in the usage of SSTs, influencing both customer satisfaction and the tendency to recommend the service to others (i.e., WOM communication). Hence, practitioners should act on all CXQ attributes when setting their SSTs. For instance, providing clear information and instructions for SSTs could increase customers' perception of their ability to use these technologies and make the experience easier and more favorable. Furthermore, it is imperative for practitioners to ensure the reliability of SSTs and the adequacy of performing well. Stand-by solutions or technicians should be available to help customers who are less familiar with SSTs or in the case that any unexpected errors or problems occur. Any issues due to the lack of alternatives or reliability could jeopardize customer trust. Furthermore, all SSTs should be consistent with and compatible with customer inquiries and potential knowledge. In doing so, SSTs will be more user-friendly, thus enhancing customers' perceived control over these technologies and making their experience pleasant and natural. Of particular note, airline providers should devote great effort toward enhancing the reliability of the services provided and maintaining their quality over time because the consistency of the quality of these services was found to be highly appreciated by passengers. Finally, this study emphasizes the significant impact of CXQ on WOM communications. This finding indicates that managers can develop CXQ strategies and practices that can lead to customers' behavioral outcomes, including the spread of positive WOM.

The social implications of this research extend beyond the immediate benefits of improved experience and customer satisfaction. As customers become more familiar with and normalize using SSTs in routine activities like air travel, they will increasingly accept them as an integral part of their daily lives.

This growing familiarity fosters a positive attitude toward technological advancements and reduces resistance to future innovations. Thus, the findings of this research contribute to a broader societal shift toward embracing and seamlessly integrating technology into everyday experiences, ultimately enhancing overall technological literacy and readiness for future advancements.

## 8. Conclusion

In conclusion, this research gives insights into the discussion on the context-specific nature of the measurement of CX or CXQ by emphasizing the importance of "two additional elements" in measuring CXQ in the airline industry. On the other hand, the results support previous research conducted in different contexts, indicating a positive impact of CXQ on both satisfaction and WOM. More specifically, this research also provides valuable inputs on the relationship between SSTs and CXQ within the airline industry. Through a comprehensive analysis of factors such as risk, ease of use, and usefulness inherent to SSTs, alongside CXQ characteristics including peace of mind, moment of truth, outcome focus, and consistency, this research has revealed the mechanisms through which SSTs influence customer perceptions and behaviors. By examining these factors, the research provided valuable insights into how SSTs shape CXQ, ultimately informing strategies for enhancing customer satisfaction and fostering positive word-of-mouth recommendations within the airline industry and the broader tourism sector.

## 9. Limitations and Future Studies

This research has some limitations that can offer opportunities for future research. Further studies are required to enhance the generalizability of this study's model. This study considers some of the characteristics of using SSTs. Future studies might also consider additional characteristics of SSTs, such as enjoyment and design. In addition, most of the study's respondents are males. Future studies with a more representative sample based on a more structured random sampling method might be valuable in supporting this study's findings. Moreover, the impact of SSTs on CXQ could vary with demographic variables such as age, gender, and income. For example, young adult consumers are more likely to have favorable CXQ than older consumers. Future studies could also be conducted in different countries to enhance the generalizability of the results.

In addition, future studies could consider customer skepticism toward using SSTs. One could argue that customer skepticism toward SSTs is more likely to weaken the CXQ and make it less favorable. Furthermore, this research considers only one service context, namely, airline services; some other service types can be included in future studies. Through these enhancements, the role of CXQ in the relationship between the perceived characteristics of SSTs and customer satisfaction for all service settings can be strongly supported and generalized.

Lastly, while there is a rising interest in examining consumer perception and behavior in the neuromarketing context (e.g., Alsharif et al., 2022/2024), future studies could examine the role of SSTs on CXQ using a neuromarketing approach, which could help in better understanding the neural and emotional responses of customers, leading to generating more effective strategies.

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