The impact of traveler-focused airport technology on traveler satisfaction

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ABSTRACT

With the increase in the volume and complexity of air travel, the air transportation industry is undergoing a period of rapid evolution. Airports, as key players in the industry, are increasingly rebranding themselves as destinations, instead of just thoroughfares. In the post-9/11 world, travelers tend to spend more time in airports due to changes in security protocols. Therefore, airport service providers are increasingly trying to improve travelers' experiences. Since a wide range of technologies could be used to do so, the current study develops an instrument that captures travelers' perceptions of airport technologies and tests a theoretical model that examines the relationship among different types of airport technologies and travelers' confidence, enjoyment, and satisfaction. We conducted two separate studies with a total sample size of 353 participants. The findings suggest a positive relationship between airport self-service technologies and travelers' confidence benefits and enjoyment — which results in positive effects on overall traveler satisfaction.

1. Introduction

During the last several decades, American travelers have had remarkably low trust in the air travel industry (Fodness and Murray, 2007; Schwadel, 1989). A recent study revealed that airports generally do not meet travelers' expectations (Yang et al., 2015). Reasons for such poor evaluations include the incompetence of airport staff, long waiting times, poor navigation systems, a lack of information, and inconvenient flight schedules (Chen and Chang, 2005; Correia et al., 2008; de Barros et al., 2007; Fodness and Murray, 2007). Passengers do not easily forgive such service failures. In a growing marketplace, they have the freedom to choose from among a variety of airport options. High levels of competitiveness put increasing pressure on airport marketers to differentiate themselves by meeting – and exceeding – travelers' rapidly changing needs (Fodness and Murray, 2007). Thus, airport managers undertake great efforts to increase passenger satisfaction.

Travelers not only expect to receive valuable information and efficient processing from airport staff (Fodness and Murray, 2007); they also demand precise online information (Forgas-Coll et al., 2013; Kim et al., 2009) and self-service options (Noronen-Juhola, 2012). Since technology has become an integral part of the travel industry, air travel has benefited from the use of various travel-related technologies such as self-service technologies, biometrics, wearable technologies, and smartphone applications to support airport operations. These

technological advances, when complemented by airport IT platforms, provide a unique opportunity to develop the "intelligent airports" of the future (Rostworowski, 2012).

Self-service airport technologies such as check-in, baggage drop, information, and ticketing kiosks have been shown to be highly effective since they reduce waiting times (Abdelaziz et al., 2010; Lin and Hsieh, 2011). Smartphones, Big Data, biometric systems, and near field communication are changing the traveler experience (Kalakou et al., 2015). For instance, Trudeau airport in Montreal has continuously developed smartphone services, starting from free SMS alerts to mobile website and navigation applications (Rostworowski, 2012). The use of automated bag-drop off systems is anticipated to reach 50% of all baggage drops in the next few years. IATA predicts that within five years, passenger and baggage check-in will be performed exclusively by self-service options (Kalakou et al., 2015). Even when technology fails due to human or technical errors, travelers' confidence in airport technologies can be retained by using expedient recovery strategies and backup systems (Zhu et al., 2013). Therefore, the availability of state-of-the-art technologies and the growth of smartphone apps make it possible for airports to take the passenger experience to the next level (Wattanacharoensil et al., 2016).

Because passenger satisfaction is paramount for airports, novel technologies may help them increase passenger satisfaction and provide positive experiences. To this end, the limited literature provides a

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rationale for an association between airport technologies and passenger satisfaction (Meuter et al., 2003). Passenger satisfaction and airport services expectations have typically been captured through surveys assessing airport service quality, which were developed in accordance with Parasuraman et al.'s (1985) service quality framework (Tsai et al., 2011). The findings from such studies are extremely valuable performance benchmarks, building (Chen, 2002; Fodness and Murray, 2007) and identifying opportunities for service improvements (Yeh and Kuo, 2003). Though airport service quality instruments are multi-faceted, they seldom capture the nuances of airport technologies (Fodness and Murray, 2007; Yang et al., 2015). Therefore, an evaluation of airport technologies based on a service quality framework overlooks some unique aspects of the interaction between travelers and airport technologies (Bezerra and Gomes, 2016).

To address that gap, a specific measurement scale for airport technologies is needed. Though the topic of airport technologies has not been neglected in prior research, previous studies have focused on technology acceptance, adoption, and barriers to adoption such as technology anxiety or technology readiness (Lee et al., 2012; Liljander et al., 2006; Meuter et al., 2003), or the effect of airport technologies on processing times and service efficiency (Abdelaziz et al., 2010; Lee et al., 2014). Therefore, there is a lack of understanding of how travelers evaluate various technology features at the airport, and which cognitive and affective mechanisms might explain such responses to technology. To that end, this study aims to 1) *develop an instrument that measures travelers' perceptions of airport technologies* and 2) *develop a model that captures the relationship among different types of airport technologies, travelers' confidence, enjoyment, and satisfaction*. Moreover, the study aims to make a practical contribution to airport managements' efforts to meet and anticipate traveler needs.

The paper is organized as follows. The first part discusses the growth of air travel and airport technologies. Next, the measurement model is developed. Following a description of the conceptual framework, we introduce the research hypotheses and then the study design and data collection method. The study results are then presented and discussed. The manuscript concludes by considering the study's limitations and theoretical and practical implications, and suggests areas for future research.

2. Research background

Air travel is experiencing an ever-increasing level of demand, which is expected to keep rising by 4% per year until at least 2020 (Tam et al., 2010). A negative consequence of such rapid growth is a debatable level of service at airports and a misunderstanding of service expectations, which cause financial and market losses (Chen and Chang, 2005). In the post-9/11 world, passengers tend to spend more time in airports due to changes in security protocols, which results in a high volume of complaints and low levels of satisfaction with the airport experience. Accordingly, airport practitioners search for ways to improve passenger satisfaction, but also to optimize operational indicators as well as cost and pricing strategies without reducing service quality (Kuo and Liang, 2011).

Since empowered travelers now seek new ways to take control of their travel experiences, the airport industry has embraced innovative technologies to meet their needs. The latest airport improvements include investing in technological innovations that help travelers streamline the check-in, baggage drop, and gate-locating processes. Such technologies offer a better airport experience by improving the ease of navigation, reducing waiting times in queues, and providing flight information. Technology changes the nature of services, the mode of service delivery, and the practice of service innovation and service management (Wilson et al., 2012). Because uncertainty is an important element of traveler frustration (Grupe and Nitschke, 2013), airport technologies should be designed to reduce anxiety and increase travelers' confidence. Although Meuter et al. (2003) reported that

individuals with technology anxiety are less satisfied with self-service technologies, the perceived quality of self-service technologies generally leads to increased satisfaction and intention to use these technologies (Lin and Hsieh, 2011).

Airports were regarded as purely utilitarian infrastructures in the past. To mitigate negative experiences with prolonged security protocols, airports have used rebranding strategies to integrate their surroundings or to become reinvented as destinations in their own right instead of just thoroughfares (Tsui, 2014). Aside from operational quality assurance, destination-focused rebranding emphasizes the need to create enjoyable experiences at airports. As suggested by the tourist destination image literature, positive affective evaluations result in increased satisfaction (del Bosque and Martín, 2008). Based on these considerations, airport enjoyment and traveler confidence predicted by effective technology gadgets may positively influence travelers' satisfaction with the airport experience.

2.1. Airport self-service technologies

Self-service technologies (SSTs) are technological interfaces that allow customers to produce a service that is independent of direct service employee involvement (Elliott et al., 2008; Meuter et al., 2000; Robertson et al., 2012). Automated teller machines (ATMs), automated hotel checkout, online banking, and Internet-based services are some examples of SSTs (Halstead and Richards, 2014; Zhao et al., 2008). Such technologies are increasingly changing the way customers interact with organizations to create service outcomes (Meuter et al., 2000), and airports are no exception (Abdelaziz et al., 2010). Airport SSTs such as ticketing, information, common use self-service, and retail kiosks offer benefits for both service providers and their customers (Abdelaziz et al., 2010); they create a competitive advantage for airlines (Drennen, 2011). In many airports, travelers can purchase tickets, change flights, update personal information, check in, select seats, check baggage, and monitor the flight status independent of direct employee involvement using technological interfaces (Weiss, 2006). Surveys of passenger opinions about airport technologies reveal that their popularity continues to rise as self-check baggage, transfer, and boarding options become available (Marintseva, 2014). Airports enjoy a decrease in operating costs from $3.68 per passenger for standard check-in to $0.16 per passenger for self-service check-in. This study conceptualizes currently used airport SSTs as such technological interfaces.

2.2. Airport supporting technologies

Supporting technologies are technological interfaces and outlets that airport operators can use to provide a high level of customer service, enhance revenues, improve operational efficiency, and achieve other relevant management objectives. For example, business centers, tour guide smartphone apps, and USB chargers might enhance travelers' enjoyment in the airport. Such amenities are also important for the hospitality and tourism industries. For instance, Yung and Chan (2002) found that hotel business centers have a significant impact on guests' behavioral intentions, including satisfaction and repurchase intention. More recently, Bilgihan et al. (2016) claim that advances in technology and subsequent guest-related amenities such as universal battery chargers in the guestrooms have the potential to improve the guest experience. To facilitate navigation within airports, airlines have pioneered mobile indoor navigation applications by providing terminal maps. Airports quickly caught onto the trend, and now provide more detailed and useful tour guide airport apps. Although such technological interfaces do not fall under the umbrella of core airport technology that is focused on service optimization processes, they complement the airport technology experience by either facilitating the use of mobile devices and personal gadgets at airports, or accommodating passengers' responsibilities and lifestyles.