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Griffith Aviation

The Impact of Technology-Based Self-Service on Airline Passengers

By

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EXECUTIVE SUMMARY

The provision of service in many industries is affected by the introduction of Self-Service Technology, none more so than in the airline industry. Many of the traditional service encounters have been changed from a position of consumers directly interacting with front-line service employees, to an encounter between consumers and a technology-based self-service (TBSS) facility.

The purpose of this research is to contribute to understanding the impact on airline passengers of this ever-increasing use of TBSS by airline companies from the point of sale through to the flight booking and check-in processes.

The objectives of the research are to examine the principal factors affecting adoption or rejection of TBSS. To determine the effects on customer satisfaction as a result of reduced personal interaction due to the use of TBSS. To make a comparison of the use of TBSS in airlines compared with other industries and examine passenger preference on the use of the Internet versus airport kiosks for flight check-in. The results of the research were based on reviews of literature relating to the objectives. The literature included academic journals, industry journals, masters and doctorate theses, aviation industry surveys and reports.

The results indicated some concerns expressed about the loss of personal interaction (mainly by older, less technology confident respondents) and the sometimes-forced use of TBSS. However, the majority of respondents to surveys in the research were positive about its use.

The comparison of airline use of TBSS with other industries indicated that while it was transforming many industries, airlines were at the forefront of its use in a wide variety of commercial and operational applications.

Future research direction and potential managerial implications are also discussed since a continuation in the development of self-service is almost certain to continue through the rapid development of technology, especially in the IT area.

From the research it is evident that the impact of TBSS passengers is predominantly positive. However, airlines should ensure a “user-friendly” environment to exploit the advantages of TBSS and deliver the optimum level of service to their passengers.
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CHAPTER 1.

INTRODUCTION.

In an environment of unprecedented pressure as a result of the increasing cost of fuel, labour and asset costs, technology-based interface is being used increasingly as an alternative for the traditional service encounter (Yen, 2005). As a result of the rapid advances made in information technology, companies in the service and retail industries are making use of Technology-Based Self-Service (TBSS) which enables customers to provide a level of service for themselves. As TBSS does not require direct assistance from service personnel it not only saves labour costs, but in many cases also provides a more streamlined and efficient service (Meuter, et al., 2000).

Since the record profits of the late 1990’s there have been substantial changes in the global airline industry. Terrorist attacks in the USA on September 11, 2001, continually escalating fuel prices, the Global Financial Crisis (GFC) of 2008/9 and various other events including health epidemics/pandemics and natural disasters have resulted in a downturn in airline profitability (O’Connell & Williams, 2011).

Labour costs and fuel costs represent almost fifty per cent of most airlines operating expenditure and are a critical element of overall airline costs (Sutherland, 2014). The significant advances in technology, the emergence of Low Cost Carriers (LCCs) and intense competition between airlines, have given impetus to the increased use of Technology-Based Self-Service (TBSS) in airline service processes (Belobaba, Swelbar, & Barnhart, 2009).

Through the promotion of their own websites LCCs started to use the Internet as a new distribution channel and limit purchases of tickets to their own airline websites (O’Connell & Williams, 2011). Legacy airlines followed this practice forcing them to become more innovative and look at additional areas of using the technology such as airport processing. The utilisation of the Internet as a distribution channel gave the airlines, both LCCs and Legacy carriers, a means of increasing their control over distributing their own product and further reducing distribution costs e.g. travel agent commissions (Belobaba et al., 2009).

Although technology is at the core of airline operations, a critical factor in the future
successes of airlines is how they infuse emerging technologies into their passenger processes. Not only in an effort to retain the customers’ loyalty and enrich their involvement in the process, but also to improve the process for creating greater operational and cost efficiencies through employee empowerment (Amadeus, 2011).

Airlines have traditionally considered service encounters (also called “moments of truth”) to be a critical part of the service delivery process that often leaves a lasting impression on its customers. However, technology-based self-service is altering this traditional service offer (Bitner, Brown & Meuter, 2000).

Airlines want to introduce TBSS into as many of the processes as possible so as to speed up these various processes to ensure consistency of service and eliminate the inconsistencies of service such as human error, sometimes experienced in the traditional customer to employee service encounter (Drennen, 2004).

Since the introduction of E-ticketing and Internet reservations in the 1990’s there has been a rapid expansion in the use of self-service facilities in airline processes. This has been achieved through the Internet at the point of sale and the check-in process (the latter through both the Internet and at airports through self check-in kiosks). Self-service technology is currently used by most airlines, although the current version is vastly different from the self-check-in kiosks that were first introduced into the airline industry in the mid 1990’s.

It is however in the use of the Internet that self-service has made the greatest advances (Wensveen, 2011; Hartevedt, 2012; Belobaba et al., 2009). The almost universal access to the Internet and the widespread use of E-commerce has greatly increased the opportunities for airlines to include TBSS in their processes. Through the TBSS processes airline passengers have a significant involvement in the delivery of service for an important part of their travel experience.

Globally in 2012, an average of 8.1 million people travelled on a commercial airline flight. Given the complex and fragmented environment in which airlines conduct their business and the growing use by travellers of the Internet in their planning and purchasing of air travel, airlines face a challenge in the distribution (marketing and sales) of their products (Hartevedlt, 2012).
The numbers of technology-based self-service transactions in which customers create their own service outcomes instead of having a company employee providing the service for them are growing significantly. Airlines still continue to use the traditional distribution channels to distribute their product, i.e. the global distribution systems (GDS) and travel agencies. However, the majority of passengers are now using the Internet for buying travel, flight reservations, ticketing and check-in self-service facilities via airline or Internet travel companies’ websites (IATA, 2013). These Internet transactions between airlines and their customers enables the airlines to target promotions and services at market segments most likely to respond positively to them (Business case studies, 2014). This not only lowers distribution costs but also enhances the airline’s brand and gives the company closer contact with their customers. These strategies have emerged also as a result of dynamic packaging initiatives, where by competitive models have forced airlines to remove the ‘middle man’ (i.e., the travel agent), offering the transparency and flexibility of purchase to target customers, while saving costs and gaining commissions on other travel related bookings such as hotel and accommodation.

Self-service technologies (SSTs) are technological interfaces that enable growing numbers of customers to interact with technology instead of face-to-face interaction with a customer service employee. The customers perform their own service without company employee involvement (Castillo-Manzano & López-Valpuesta, 2013).

Using their computers airline travellers can book flights, purchase tickets, check-in for flights and produce boarding passes without going into an airline office or speaking with an airline sales agent by phone. All of these processes/facilities can be accessed twenty four hours a day, seven days a week instead of being restricted in most cases to normal office opening hours.

TBSS facilitates consumers to perform for themselves tasks they previously had to pay travel professionals to do for them. Intending travellers can now carry out many of the functions previously performed by Travel Agents. They can plan their own itineraries, either through airline web sites or travel web sites like Tripadvisor, Virtual Tourist, Travelocity and Expedia. This has significantly reduced travellers’ reliance on, and the use of the traditional retail travel agent. Hotel and car rental bookings are similarly affected in that they are increasingly transacted via the Internet either direct with the hotel accommodation company, the rental company or via one of the travel websites.
Mobile technology in the form of smartphones and tablet devices are the most important and interesting developments in the future growth of the use of the Internet in travel planning, booking and airport check-in processing.

Rapid advances in technology will mean that self-service facilities will no doubt develop further and lead to a greater use of self-service in airline processes. In the future the role that technology will assume in service delivery is bound to expand exponentially. The challenge for managers of service organisations is to understand the potential impact these self-service technologies may have on their customers’ perception of their interactions with their organisation (Beatson, Lee & Coote, 2007).

The aim of this paper is to research the impact of technology-based self-service (TBSS) on airline passengers. First of all the focus will be on the understanding of factors involved in passengers adopting or rejecting TBSS. Furthermore to understand what (if any) effect a consequential reduction in personal contact may have on customer satisfaction and how TBSS in airlines compares with its use in other industries.

1.1 Thesis Objectives.

This study addresses four research questions to meet the aim of the research. The research questions were chosen to provide a level of understanding of the impact TBSS has on airline passengers. The research will be conducted through a review of literature on the subject matter of the four questions. Sources will be academic papers and Industry journals and International Aviation organisation surveys and reports.

The Questions:

1. What are the factors involved in the adoption or rejection by passengers of Technology-Based Self-Service?
2. Does the loss of the interpersonal service as a result of TBSS outweighs its benefits and affect customer satisfaction?
3. How does airline use of TBSS compare with other industries using it?
4. Do airline passengers view the Internet Self-Service check-in option and airport kiosk check-in options differently?
Conclusions regarding the achievement of the stated research aim will be based on the findings from the literature reviews, industry journals and surveys. The implications for management and avenues for future research will also be drawn from them.

1.2 Thesis Organisation

The remainder of the research paper is organised as follows:

Chapter two begins with a brief discussion on the background of the research related to the evolving of TBSS in the airline industry. It provides a definition of TBSS, the concept of service, the infusion of technology into the service encounters, TBSS in Airlines and finishes with a brief view of self-service options in other Industries.

Chapter three consists of a brief description of the methodology used in the research, the research purpose, the criteria used for research literature selection, the literature selected, the rationale for the research, data collection and the limitations of the study.

Chapter four contains reviews of the various literature items chosen for their relevance to the aim of the thesis. Important issues relevant to the questions posed to provide a basis for the research will be addressed in the literature selected. Although some of this research described in the literature is not conducted using airline passenger respondents, the adoption or rejection factors involved in TBSS do apply.

Chapter five consists of a summary and discussion of the findings from the literature reviews and their relevance to the four research objectives to demonstrate that the questions have been answered and also contains a discussion about the aim of the research. Other relevant research material found during the study has also been referred to.

Chapter six proposes some implications for airline management and suggests the need for and direction of future research into the impact on airline passengers of Technology-Based Self-Service.

Chapter seven provides the conclusions that will draw the major points revealed by the research findings together to demonstrate that the research aim of determining the impact of TBSS on airline passengers has been achieved.
CHAPTER 2.

BACKGROUND

Self-service technology is being employed in every day interactions between industry, business, commerce, government services and people in the general community. Banks, supermarkets, many telephone information services and a host of other service oriented entities employ self-service technology based facilities. The four most commonly used forms of TBSS are, Self-Service Kiosks, the Internet, Mobile devices (Smartphones/Tablets) etc. and land line Telephones.

As an early example of self-service technology, banks introduced automated teller machines (ATM) in the 1970s. Since then they are in operation almost all over the world and number in excess of 1.8 million. In the USA alone ATM transactions number fourteen billion per annum and ATMs are used by over 90% of consumers (Castro, Atkinson & Ezell, 2010).

2.1 The Concept of “Service”

A “service” Industry is generally regarded as “doing things” for customers rather than “making things” for them (Silvestro and Johnston, 1990). The offerings of a service industry, which are described as intangible, are distinctly different from manufactured goods. Although service is mostly viewed as intangible and seen as an activity rather than a tangible product, service outputs have tangible components such as equipment and personnel (Johns, 1999).

Gummesson (1994, p.2) clarifies this position as follows: "Customers do not buy goods or services in the traditional sense. They buy an offering and the value (may) consist of many components, some of them being activities (services) and some being things (goods)".

Airlines fit this example as they offer products in the form of a variety of airfares, which although purchased and generally delivered electronically, they still represent a tangible product with which the consumer is then able to fulfil the purpose of their purchase (the transportation portion). Additional services, such as flight reservations and flight check-in that also form part of this research are required prior to being able
to board an aircraft. These functions are possible on a self-service basis via various electronic means, but also remain available through the traditional service offer of face-to-face interaction between service staff and consumers.

2.2 Infusion of technology into service encounters

The traditional service encounter or “moment of truth” between a customer and company representative was characterised by Bitner, Brown and Meuter (2000) as a “low tech, high face-to-face contact”. The infusion of technology into airline processes has the effect of changing these encounters to a “high-tech, low face-to-face contact” (Bitner, et al., 2000). The infusion of technology into the service encounter has meant that passengers have assumed the role previously carried out by an airline employee in the provision of a service (Castro, Atkinson & Ezell, 2010). Very often the introduction of technology into a service process can ameliorate the delivery of a service. The current trend is to let customers serve themselves via the Internet, without the presence of customer service employees, resulting in the absence of the human interaction element in a service encounter. In effect, technological advances are changing the way services are being delivered, especially the way in which self-service options are being employed. (Dabholkar, 2000).

2.3 Definition of TBSS

The term “Technology-Based Self-Service (TBSS)” was first introduced in Dabholkar’s (1994) paper "Technology-based service delivery: a classification scheme for developing marketing strategies", in the Advances in Services Marketing and Management Journal. Later, Meuter et al. (2000, p. 55) defines TBSS as a technological interface that enables customers to produce a service independent of service employee involvement”.

2.4 TBSS in Airlines

TBSS was introduced into airlines over 20 years ago with limited use, it came to prominence in the mid-90s and is now used by almost all airlines. Before the introduction of airline self-service facilities via the Internet were readily available, the majority of airline bookings were transacted through Global Distribution Systems (GDS) such as Sabre, Amadeus and Apollo (Drennen, 2011).
Airlines are classified as a service industry and in the competitive aviation marketplace where pricing is not always the major differentiator (leisure travel versus business travel and long haul versus short haul flights), often airline competition is based on the provision of customer service and not solely on price (Rust, 1998).

Airline self-service options come in several forms, the Internet, airport kiosks and more recently in the form of smart phones and other mobile devices. The point of sale options are via the Internet i.e. flight reservations and ticketing, seat reservation and check-in. Airport options are information kiosks (stand alone terminals that provide information and services) and check-in kiosks (for flight check-in, seat assignment and baggage labeling).

On average, more time is spent by today’s airline passengers “surfing” the net each week than watching television. They are online citizens who interact with and use the various consumer technology devices to make their own travel arrangements. This means that they will expect airlines and their authorized agencies and other Internet facilities to service their needs through their digital channels (Hartevedt, 2012).

2.5 Self-Service Options in Other Industries.

Self-check out systems are used by supermarkets, banks are using automated teller machines and digital photograph processing companies (see Figs.1, 2 & 3) as well as many others are all increasingly utilising technology-based self-service (TBSS) to provide customers fast and convenient service. Some of the other areas of use are health services, information services and parking stations and toll roads for payments of fees (Castro, Atkinson, & Ezell, 2010).

Figure 1. Bank ATM. Figure 2. Photo Printing Kiosk. Figure 3. Supermarket SST check-out.
Internet self-service options: Retail E-commerce, online banking, E-learning, online health checks (via SKYPE) and access to government services.

Other Mobile devices: Include smart phones, tablet computers and contactless credit cards (smart cards).

Telephone applications: A major change in technology was the introduction of dual tone multi frequency (DTMF) phone systems that facilitated callers to navigate through a pre-set menu to direct their own call to the desired department or person. As an example of advances in technology these DTMF telephone systems are now being replaced by interactive voice response (IVR) phone systems. Some airlines use this technology to facilitate enquirers to check on the status of flights (Castro, Atkinson & Ezell, 2010).
CHAPTER 3.

METHODOLOGY

Chapter overview

The research in this thesis has been conducted entirely based on reviews of literature. The reviewed literature was sourced from published academic papers and journals, industry journals, aviation industry surveys and reports. The literature chosen for review was selected for its relevance to the four questions that were set as objectives and to meet the aim of the research. The principal aim being to determine the impact of TBSS on airline passengers notably the adoption or rejection factors and the effect of reductions in human interaction on customer satisfaction.

3.1 Research Purpose and Approach.

The purpose of the research is to help in the understanding of passengers’ perception, or how and why passengers adopt or reject technology-based self-service. “To determine the most efficient, effective and mutually acceptable use of technology in service delivery, the customer’s perspective (of the service) needs to be known and understood” (Anitsal, 2005, p. 4). The research approach employed in this thesis is qualitative and descriptive.

3.2 Criteria for literature selection.

To enable a judgement to be made on the choice of literature to be used in the research, the following list of criteria was used in the selection of literature considered suitable for researching the impact of TBSS on airline passengers:

1) The literature had to be based on research in the use of TBSS
2) The literature had to be relatively recent i.e. since the introduction by airlines of a limited form of TBSS in the mid 1990s (Drennen, 2010).
3) The literature needed to address the factors for adoption of rejection of TBSS to determine the impact on consumers.
4) The literature needed to include discussion on the effects of a reduction in human interaction in the service encounter.
5) The literature had to contain discussion on the use of TBSS in other industries to facilitate a comparison with its use in airlines.

6) The literature had to include how passengers perceived the use of the Internet application of TBSS for check-in compared with the airport check-in kiosk option.

7) The choice of a suitable survey of airline passengers conducted by an aviation industry body to compare the various forms of TBSS including the traditional human interaction option.

3.3 The Selected Literature:

Although the initial search revealed a plethora of ‘suitable’ academic and industry articles available on a variety of topics related to TBSS, a manageable and practicable selection had to be made for research. Reference to other articles in the analysis and discussion is made if the authors are supportive of or contradictory in their findings or determinations to the reviewed literature or if their views are in other ways relevant to the research aim. Six articles were chosen for their suitability to provide material for responses to the four research questions and their relevance to the research aim. A seventh, a review of a global passenger survey conducted by IATA in 2013 is very relevant to research questions one and four as well as the main aim of the research.

The following items were selected for review having met the criteria mentioned in 3.2 i.e. to have relevance to the stated objectives and to meet the aim of the research.

1. Dabholkar, P.A. (1995), "Consumer evaluations of technology-based self-service options” chosen for its focus on the factors in the adoption or rejection of TBSS. Dabholkar introduced the term Technology-Based Self-Service (TBSS) in 1995 and proposed a model of what she considered important characteristics in influencing consumers’ perception of TBSS. As a pioneer in the field of TBSS research, Dabholkar’s attribute model and theory have since been used by numerous other researchers. Modified formats of her model and adoptions of her research appear to have been the foundation on which much of the other research on TBSS has been based. In the model Dabholkar identified five major attributes important to customers’ perception of TBSS.
2. Wang & Namen (2013). “Customer Adoption of Technology-Based Self-Service.” This paper is chosen for its relevance to research question one, its focus on understanding of customers’ behavior in the adoption or rejection of TBSS. The authors use Dabholkar’s model and major attributes as their first aspect of behavior and expand on some other aspects of customer behaviours in adoption or rejection of TBSS including situational factors and the concept of relative advantage.

3. Walker, Craig-Lees, Hecker and Francis (2002). “Technology-enabled service delivery: An Investigation of reasons affecting customer adoption and rejection” As the title of their paper suggests Walker et al.’s research investigates the factors involved in customers’ adoption or rejection of TBSS and is the main reason for it having been chosen. The authors emphasise the importance of the way that service oriented companies infuse technology into their self-service processes. They also use a model with a similarity to Dabholkar’s attributes model.


5. Liu, (2012). “The impact of forced use on customer adoption of Self-Service Technology.” This literature addresses the question raised in objective number two related to customer satisfaction. Liu examines how and why the loss of interpersonal contact as a result of TBSS affects customer satisfaction. His model explores the effects of Technology Anxiety, Technology Trust and Forced use as factors in determining satisfaction with TBSS and the intention to use it.
6. Castro, D., Atkinson, R., & Ezell, S. (2010). “Embracing the Self-Service Economy” In this paper the authors research the importance and implications of the advances made in information technology (IT) and the impact it has had on people and industry This paper was chosen to make the comparison between other industries that use TBSS and its use in the airline industry.

7. The IATA Global Passenger Survey 2013. This survey was chosen for its importance in supporting the overall findings from the literature reviews. The survey has a focus on determining preferences between the Internet and various other forms of flight check-in. It also addresses the various forms of making flight reservations and comparisons are made between Internet bookings made on airline websites, with online travel companies or personally at travel agencies or airline travel centres.

3.4 Rationale behind the study.

Due to the rapid advances in technology significant changes are likely to occur in the way that TBSS will be managed and the changes this may bring to the way in which staff previously involved in the traditional interpersonal service encounter are utilised. It is hoped that the findings of this research will help airline management meet these challenges for the benefit of the passengers, the company and its staff.

3.5 Data collection

Data collection was based on previously conducted research and obtained through reviews of literature relating to the stated objectives. The principal methods used in the literature included observations, questionnaire based interviews, open question interviews and surveys. The IATA Global Passenger Survey (2013) had by far the greatest number of respondents with almost eight thousand.

3.6 Limitations of the study.

The research is limited to research relative to the four research questions and the main aim of the Thesis “The impact of Technology Based Self-Service on airline passengers”. The study is confined largely to the consumer perspective of TBSS. The number of respondents and interviews in research literature chosen for review are
relatively small. Another limitation of the research is the number of articles reviewed. However, the articles provide an appropriate framework from which to draw some key issues. While more articles may have enhanced the overall outcomes, the research rigour was balanced with time constraints and practicability in mind. While the limitations offer suggestive and indicative results rather than conclusive results, more research is encouraged in this area to enhance the industry’s awareness of the implications of TBSS for airline management and the impact on its passengers.
CHAPTER 4

REVIEWS OF THE LITERATURE

Chapter Overview:

This chapter contains reviews of four research journals, one masters’ thesis, a research paper for a doctorate and an aviation industry (IATA) passenger survey. The literature was selected for relevance to one or more of the four objectives or to the main aim of the research. Each item of literature is reviewed in this chapter and discussed in chapter 5 with its relevance to one or more of the research questions.

4.1 Literature Review 1.


Introduction

This is a review of the article "Consumer evaluations of technology-based self-service options: an investigation of alternative models of service quality” by Prathiba Dabholkar (1995) which appeared in the International Journal of Research in Marketing. The review is carried out in support of research question one i.e. to determine the factors that influence adoption or rejection of TBSS by airline passengers. Although the research is not carried out with airline passengers as subjects it can be argued that the principle of adoption or rejection of TBSS remain the same. In the article Dabholkar (1995) proposes the offering of TBSS by companies to their customers was prompted by rising labour costs plus the ability to use the advances made in technology to facilitate these self-service options.

The model she proposes is based on an attribute model of service quality. The attribute model is based on what Dabholkar believes are the important characteristics that influence a consumer’s perception of TBSS and lead to its adoption. Dabholkar (1995) conducts a study to test the attribute model on a proposed self-service scenario and includes different waiting time options to study the effect of a situational factor.
The review will firstly summarise the article, secondly explain the study, thirdly explain the method and data collection and fourthly note the results of the study.

1. Article Summary:

Dabholkar (1995) identified five attributes of service delivery important to a customer’s perception of TBSS: Speed of delivery, ease of use, reliability, enjoyment and control. She conceived an attribute-based model for the cognitive evaluation of characteristics associated with the perception of and intention to use technology based self-service options (see Fig.4).

**Speed of delivery.**

Dabholkar (1995) sighted Maister (1985) who suggested that the slow delivery of a service affects the overall perception of service and its quality. Therefore a faster service delivery will positively affect a customer’s perception of a service. The conclusion being that a speedy delivery of a TBSS option will have a positive effect on the customer’s perception.

**Ease of Use.**

If a customer’s expectation is that the technology is difficult and has concerns about its use, they may look for the traditional interpersonal option. If on the other hand it is expected/perceived to be easy TBSS will be seen as a favourable option. The conclusion in this case is that an expected ease of using TBSS will have a positive effect on a customer perception of it.

**Reliability**

Dabholkar sighted that a survey conducted by Van Gorder (1990) found that reliability to be one of the most important factors in the acceptance of TBSS. Any concerns about the reliability of the new technology often lead to thoughts of rejection of the TBSS option.

**Enjoyment**

Dabholkar (1996) sights research by Davis, Bagozzi & Warshaw (1992) on the use of computer technology that found customers valued fun in using the technology. Hence
gaining enjoyment from the use of TBSS was important to customers in their evaluation of it.

Control

Dabholkar (1995) sights Langford et al. (1981) who found control to be very relevant in a customer’s evaluation of TBSS options. This supported by Bateson & Hui (1990) who are in agreement that the feeling of control is often as significant as the actual control itself.

Dabholkar’s Attribute Model.

![Diagram](https://via.placeholder.com/150)

Control Fig. 4. Cognitive evaluation of characteristics associated with perception of and intention to use technology-based self-service options (Dabholkar, 1995).

2. The Study

A study was based on the conducting of decision-making research where customers had the choice of using a touch screen or verbally placing an order for a meal in a simulated “fast food” outlet environment. College students were selected as candidates for this study as for fast food outlets they represent a major consumer group as sighted by (Wall St. Journal, 1990).

3. The Method/Approach

Using a scenario-based approach Dabholkar reasoned that a field study would be too long for customers of a “fast” food restaurant and the scenario approach also facilitated simulation and manipulation of waiting time. Waiting time was the only situational influence incorporated into the study. Other situational influences such as
crowding may be investigated in future research. As students are used to crowding this aspect may have more impact on a more diverse group.

Several scenarios were used employing touchscreens with different situational aspects and ordering options including length of waiting times. The study consisted of 505 undergraduate students. Women with an average age of 25 years comprised 53.5% of the participants. Men with average age of 24 years represented 46.5% of the participants.

Data collection was carried out after participants were advised that it was a voluntary research exercise and responses would remain anonymous. Of the total participants, 204 were given the low waiting time scenarios, 186 the high waiting time and 115 given scenarios with no mention of waiting time.

4. Results

Dabholkar (1995) found that enjoyment and control were important factors in determining service quality. Results for the low waiting time groups also found that intentions were directly affected by control and enjoyment. Therefore, a feeling of control over the process of service delivery impacts the intention to use the TBSS option. The potential enjoyment of the TBSS option was found to enhance customer evaluation of the option and a shorter waiting time also directly increased the intention to use TBSS.

Ease of use was also found to be an important factor in the intention to use TBSS. An aspect of user-friendly design is that it further enhances customer evaluation of the TBSS option. Speed and reliability were not major factors in overall perception of service quality but they did affect results in the high waiting time group.

Overall the finding was that more than two thirds of the respondents said they preferred the touch screen ordering option to the verbal ordering option. It suggests that this genre of TBSS would be well received and readily adopted. The finding that enjoyment and control were strong influencing factors suggests that they should be incorporated into the service design. The control influence/aspect is vital to ensure that customers are not over-awed by the technology.
4.2 Literature Review 2.


Introduction:

This is a review of a Masters Thesis by Jin Hui Wang and Jose Namen (2013) “Customer Adoption of Technology-Based Self-Service. A Case Study on Airport Self Check-in Service”. This review is also carried out in reference to research question one, the factors involved in adoption or rejection of TBSS by airline passengers. The data is collected from airline passengers mainly related to airport kiosk check-in.

The review will firstly summarise the article, secondly explain the methodology and data collection, thirdly reveal their findings and fourthly give their conclusions.

Summary:

Wang & Namen describe purpose of their research as contributing to the understanding of customers’ adoption behaviour of TBSS. They propose 3 major concepts of adoption behaviour in the customer’s and explanations for the impact they have on the adoption or rejection of TBSS by consumers. They pursue their research purpose through the investigation of the different adoption behaviours of customers and their relationship to the three major concepts of innovation attributes, customer characteristics and situational factors. They based their study and data collection on conducting interviews and through observation.

**Behaviour concept 1. - Innovation attributes:** The fact that the nature of the service encounter has been changed can be considered as an innovation and the customer has to adapt to the new self-service options. Wang and Namen are supported by Dabholkar (1995) who proposed the following attributes as being important in a consumer’s adoption or rejection of TBSS options. They were: speed of delivery, ease of use or complexity, reliability or perceived risk, control or the extent to which TBSS is perceived as giving control to customers and enjoyment, or the extent to which TBSS is perceived as being interesting or enjoyable. Wang and Namen have added
the concept of relative advantage or how TBSS is perceived to be better than the alternative.

**Behaviour concept 2. - Consumer characteristics:** The relevant consumer characteristics include demographics i.e. age, gender and education, attitude towards self-service (interaction and non-interaction with service employees) and consumption behaviour (how frequently the customer needs the service).

**Behaviour concept 3. - Situational factors:** These situational factors include time pressure (available time to complete process), waiting in line and a crowded environment (the extent to which these affect decision making re TBSS).

**Methodology.**

Wang and Namen based their data collection methods on observation and interviews. They chose airport self check-in for their research as a place where self-service kiosks are commonly used. This Self-Service option exists side by side with the traditional interpersonal option of airline personnel staffed check-in counters at airports. Passengers can use either an e-ticket or a paper ticket (now becoming more rare) with the self check-in kiosk. The choice of option is a matter of passenger preference. In the study passengers were mainly observed during the check-in process.

**Data collection:**

Data was collected through interviews and classified into a questionnaire based interview and an open-question interview.

**Findings for the questionnaire-based interview:**

<table>
<thead>
<tr>
<th>Innovation Attributes</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 Adoption preference</td>
<td>3.927</td>
<td>1.008</td>
</tr>
<tr>
<td>Q2 Relative advantage(s)</td>
<td>3.833</td>
<td>0.937</td>
</tr>
<tr>
<td>Q3 Ease of use</td>
<td>3.958</td>
<td>0.988</td>
</tr>
<tr>
<td>Q4 Risk Perception</td>
<td>3.229</td>
<td>1.031</td>
</tr>
<tr>
<td>Q5 Enjoyment</td>
<td>3.340</td>
<td>1.151</td>
</tr>
</tbody>
</table>
Q6 Control 3.542 1.222

**Consumer Characteristics:**

Q7 Need for avoiding interaction 2.435 1.097
Q8 Need for personnel assistance 3.758 1.209
Q9 Attitude toward technology 4.354 0.808

**Situational Factors:**

Q10 Time pressure 3.61 1.301
Q11 Waiting line (length) 3.83 1.176
Q12 Crowded Environment 3.94 1.192

*Table 1. Descriptive statistics of service attributes and customer attitude*

**Results:**

Using a scale of 1 to 5 with 1 the worst and 5 the best, the overall perception of self check-in was that it was a good option with a score of 3.927 (Adoption preference).

In the **Innovation attributes** relative advantage and ease of use received the highest scores at 3.833 and 3.953 respectively. The “relative advantage(s)” term was intended to gauge the perception of new self check-in service compared with the traditional check-in counter option.

In the **Consumer Characteristics** category the score for Q7 of below 3 for the “need for avoiding interaction” question indicates that the respondents largely disagree with this notion. However, attention should be paid to the result for Q8 “the need for personnel assistance” whose mean value is relatively high at 3.758. It indicates that respondents still consider personnel assistance as important although there is a very positive attitude to technology in general with a score of 4.354.

**Demographics and education profile (part of consumer characteristics).**

Wang & Namen found that a high percentage of older passengers still enjoyed self-service technology. 6.3 percent of respondents were younger than 20 years, 22.9 percent were between 20-30 years. The age group 31-40 years accounted for the largest percentage at 38.8 percent. The over 40-age group represented 32 percent of
The customers they sampled also enjoyed a relatively high education profile with 85% of respondents being repeat users of self-service check-in and having high school diplomas or higher education qualifications. However, a relationship between education levels and the rate of TBSS adoption was not established and will require further research.

**Situational Factors:**

Situational factors included whether the passenger was in a hurry, the relative length of the waiting lines and the situation of a crowded environment.

Results indicated respondents preferred to use self-service even when the waiting line was shorter at the personnel staffed counter check-in and under a “crowded environment” respondents preferred to use self-service. Passengers in a hurry showed a preference for the option with the shortest waiting lines.

**Results for the open question interview:**

There were a total of ninety-six respondents to the open question interview after self-service check-in:

Of seven first-time users of self check-in: four said they intended to use it in future and three said it depended on the situation.

Of forty-one respondents who had tried self check-in one or two times: twenty-one said they intended to use it in future, one said they refused to use it in future and nineteen said it depended on the situation.

Of forty-eight who had used self check-in three or more times before: forty-five said they intended to use it in the future and three said it depended on the situation.

**Overall Findings:**

The authors found that advantage, ease of use (complexity) and control were the more important factors in the adoption rates of self-service check-in. Customers who preferred this option enjoyed the higher speed of delivery, ease of use and greater control than those who avoided it. The respondents who rejected the self-service
check-in option argued that since they did not travel often they could not see any real advantage.

A need for independence was seen as a significant determinant in the adoption of self-service check-in for some passengers. For some other passengers a need for social interaction was seen as contributing to an understanding of their negative attitude to self-service check-in.

4.3 Literature Review 3.


Introduction:

This is a review of the article about Technology-enabled Self-Service by Rhett Walker, Margaret Craig-Lees, Robert Hecker and Heather Francis (2002). This review is also in support of research question one to determine the reasons why customers adopt or reject Technology-Based Self-Service delivery.

The review will firstly summarise the article, secondly explain the methodology, thirdly note their data collection and fourthly reveal their findings.

1. Summary:

The Walker et al. (2002) research is aimed at investigating the factors involved in customers’ adoption or rejection of technology-based self-service. In order to be acceptable and satisfactory to their customers, the way that service oriented companies infuse technology into their self-service processes is proposed by Walker et al. (2002) to be a crucial issue. Their study includes a discussion on the nature of their research and findings.

2. Research Methodology:

The authors conducted focus groups and interviews to gather data for their research. Ten Focus groups were held with a total of 56 participants from a broad demographic range and various socio-economic backgrounds. The respondents were in an age range from 14 years to 68 years and the ratio of female to male was approximately
60% to 40% respectively. The data collected from the discussions was recorded and transcribed and used for the construction of a conceptual model of the elements that seemed to be moderating factors in the capacity and willingness in customers’ adoption of TBSS.

![Conceptual Model](image)

Fig. 5. Capacity and Willingness relationships and Determinants (Walker et al., 2002).

**Constructs:**

**Perceived Technical Reliability:** Includes the attitudes and expectations of customers vis a vis the mechanical reliability.

**Perceived Accessibility and Complexity:** Includes ease of use and how to use.

**Relative Advantage:** How the perceived advantages compare with the interpersonal means of service delivery.

**Perceived Risk:** Includes any perceived concerns about security, system failure, reliability and other risks associated with TBSS.

**Individual needs fulfilment:** Incudes the preference of some customers for human contact rather than TBSS.

**Desire for Control:** The extent to which customers feel that both forms of service delivery gives a greater level of control over the service encounter.

### 3. Data Collection:

A pilot study and an empirical study were conducted and the results compared.
The Pilot Study: 50 participants were chosen for a pilot study, it consisted of 21 males and 29 females having a broad range of occupations. Ages ranged from 15 to 70 with 71 per cent being aged between 30 and 60 years.

Five questions were posed for each of the elements of the 7 constructs (35 in total) that affected capacity and willingness. Walker et al. determined that the responses to the five questions would indicate a willingness or otherwise to the use of TBSS.

An analysis of the pilot study data indicated willingness was at a higher level when the factors of technical reliability and personal ability were perceived to be high. On the other hand willingness appeared to be lower where accessibility and ease of use factors were perceived as limitations. There seemed to be no significant difference between the gender and age. The findings indicated support for an empirical study to be conducted. participants were chosen from various city locations such

The Empirical Study: 210 as: the central business district, a shopping mall, and a tourist precinct. Of the participants 106 were male and 104 female, 55 per cent with an income of less than A$40,000 and 44 per cent with an income of greater than A$40,000. Of the participants 55 per cent stated they had education to a tertiary level and 44.3 per cent only to a secondary education level.

4. Findings

The correlation of data in the empirical study generally confirmed the findings of the pilot study. The results of the study indicated that willingness and adoption were highest where there was a strong rating in capacity and where technical reliability appeared to be satisfactory and where relative advantage and capacity were perceived to be high and where risks and need for fulfilment were perceived to be low.

By contrast where need for fulfilment, direct control, perceived reliability were high and capacity to operate the system was low, willingness to adopt was lowered. It appeared that adoption of TBSS was dependent on the level of comfort with and capability of using technological systems. Walker et al. (2002) concluded that the actual adoption depended on two main considerations: the level of need for personal control and the accessibility and ease of use.
The desire for personal contact was reinforced by a negative association between needs fulfilment and technical reliability, the positive relationship between perceived risk and need fulfilment, and direct control and perceived risk. The perceived ease of use and access appeared supported by the positive correlation between needs fulfilment and perceived accessibility, perceived risk and perceived accessibility and desire for control and perceived accessibility.

Another finding was that adoption of TBSS is likely to be increased if the user knows that access to customer service personnel for help is available if required. The results suggested a distinction between those who preferred face-to-face contact and those who did not. There were those who wanted the personal interaction all the time and those who only wanted it in case they had a problem or when they wanted to make a complaint. Others did not seem to desire any personal interaction at all and would avoid it if they could.

It was evident that customers were more likely to adopt TBSS on a voluntary basis than non-voluntary. It also seemed that adoption was more likely if customers knew that customer service personnel and technical assistance were available if required.

4.4 Literature Review 4.


Introduction:

This is a review of a research paper of the Executive Doctor of Management Program at Case Western Reserve University by William G. Brunger (2008) in support of research question one to determine the factors involved in adoption or rejection of TBSS by airline passengers. Brunger’s study was carried out in North America with Continental Airlines passengers. Continental was chosen because its database had the advantage of size, independent variables and a complete record of distribution channel information. In his study the author addresses the preference by passengers for the use of the Internet for self-service rather than airport self-service kiosks. Brunger’s study addresses the reasons and meanings that passengers attribute to both traditional and
Internet buying behaviours and how those behaviours influence value and satisfaction.

1. Summary

Brunger’s study principally addresses the reasons why Internet customers are able to find and purchase lower airfares, but it also addresses other aspects of Internet usage in airline processes. The study examines the behaviours individual customers attribute to both traditional and Internet buying and how those behaviours influence satisfaction.

Brunger (2008) felt that as the time before the Internet already seemed a long time ago, the study needed to be carried out before the details of the distribution transition process were forgotten. Brunger (2008) felt that due to other industries being less advanced than the airline industry in the transition from traditional distribution process to the Internet distribution process it was useful to study the airline industry and the Internet. To understand how the Internet has impacted on the purchase of airfares customers were asked how their approach to process of purchasing airline tickets has changed since they had the ability to do so online.

2. Method/Data Collection:

15 “experienced” travelers were interviewed; those who travelled on a minimum of five occasions per annum for leisure purposes, or who also did a substantial amount of business travel and were old enough to remember the way airline tickets were purchased before the ability to buy them on the Internet. The interviewee group included ten men and five women, seven of whom remembered using mostly travel agents in the pre-Internet era, only five called airline reservations offices, and three used both. The participants were encouraged to speak freely and the interview protocol was open inviting unstructured responses to enable them to best describe their experiences in buying travel via the Internet.

3. Findings:

These findings support the idea that the Internet age has dramatically changed the environment around airline processes. It has changed the way passengers make their travel arrangements, how they search for suitable fares, purchase their tickets, make reservations and check-in for their flights. Brunger proposed that demographic,
geo
graphic factors and individual behavioural characteristics might moderate these changes.

An increased sense of control and level of choice was experienced by all participants by using the Internet for their travel arrangements and ticket purchase. All participants preferred using the Internet as opposed to making numerous telephone calls to airline reservations centres or airline ticket offices or travel agencies, then waiting for replies and/or having to physically go to airline offices or travel agencies.

Lower fares were not the only reason potential passengers turned to using the Internet. The sense of control, level of choice and 24x7 access were also reasons for the change from the traditional air travel point of sale process, this is supported by Zhang et al., (2006). For some of the respondents the search portion of travel purchase became an intellectually satisfying part of the whole travel experience, Brunger (2008) termed them “Search Enthusiasts”. Both the survey subjects of the study by Zhang et al. (2006) and respondents for the study by Brunger (2008) agree that “control” is the most significant aspect of the change.

Enhanced control, a wider range of search, more efficient communication and an involvement in the search were identified by respondents as the four major differences between using the Internet and the traditional way of making travel arrangements. The wide range of search and perceived feeling of control were the primary reasons for adopting the Internet while an involvement in the search process encouraged diligence. Communication efficiency and the convenience of shopping 24x7 from home or office improved the efficiency and enjoyment of the search. Some respondents felt that it was easier to understand everything by seeing it on your own computer screen rather than having someone (the agent) telling you everything that was on their screen. Brunger (2008) is supported by Hoffman et al. (2000) that the Internet allows individuals to exert much more direct primary control over their environment. The view of the majority of participants was that while the Travel Agency experience was satisfactory, there were too many benefits with the Internet to consider going back to a Travel Agency or an Airline Travel Centre.
4.5 Literature Review 5


Introduction

This is a review of an article by Shunzhong Liu (2012) entitled “The impact of forced use on customer adoption of Self-Service Technology”. Liu examines how and why forced use affects satisfaction and behavioural intention with the self-service technologies. This review is in support of research for question two that examines the loss of interpersonal contact due to TBSS and if or how it affects customer satisfaction. The review will firstly summarise the article, secondly explain the methodology and thirdly reveal the findings.

Summary

Liu’s study surveyed 290 users of self-service technology. The research model constructed for the study was designed to investigate the way that forced use influences customers’ satisfaction and behavioral intention with SST. The model includes technology anxiety and technology trust as the mediating factor of the relationship. Fig. 6 presents the proposed model.

Fig. 6. Research model (Liu, 2012).

Previous Research pertaining to the constructs used in the model.

1. Forced Use: Liu relies on previous research by Reinders et al. (2008) that concluded that customers experience a perception of loss of control due to the loss of freedom to choose a service delivery mode through the forced use of TBSS. Research (as sighted in Dabholkar, 1995) also supports this view and
considers the perception of control to be an important aspect for customer
evaluation of, and the intention to use SST. This view is also supported by
Reinders et al. (2008) who contend that forcing customers to use SST will
likely result in a negative attitude towards SST.

2. Technology Anxiety: Liu (as sighted in Meuter et al., 2003) proposes that frequent
reaction of customers using all forms of technology is anxiety or fear. The author
believes it to be the most influential predictor of SST usage. This view is supported by
Oyedele & Simpson, 2007; Zhao, Mattila & Tao, 2008 whose studies have also found
technology anxiety to have a negative effect on SST usage.

3. Technology Trust: Liu (as sighted in Johnson et al., 2008) determines that high
levels of trust in technology by consumers are found to encourage satisfaction with
self-service technology and the intentions for its use.

4. Satisfaction with SSTs: Liu is supported by Burton, Sheather, & Roberts, 2003
that it comes as no surprise that customer satisfaction is found to be to be positively
associated with behavioral intention.

5. Behavioral intentions: Liu’s (2012) hypothesis is that satisfaction with SSTs will
be positively related to behavioral intentions.

Methodology and Data Collection:
Liu’s (2012) study was based on data gathered from 290 SST users in China.
Questionnaires were distributed to a number of SST users in public locations. Trained
research assistants asked potential respondents, who had used SSTs within the past six
months, to complete a survey. The following responses relating to the five constructs
of the model were put as questions to respondents:

Question 1. Forced use:

Only self-service facilities are available when I need service.

I have less freedom to choose a service-delivery mode.

The company imposes a self-service technology on me.
Question 2. Technology anxiety:

When offered the choice to use SST, I am afraid that I might damage it in somehow.

I avoid SST because I am not familiar with it. I try not to use SST because I may make mistakes that I cannot rectify.

Question 3. Technology trust:

I have the confidence in SST to give me reliable service considering the current advanced state of SST.

I think the incidence of technology related error is very low.

My opinion is that self-service technology is very reliable.

Question 4. Customer satisfaction:

I consider that in general the self-service technologies provided by the company are satisfactory.

My expectations of the self-service technologies provided have been exceeded.

I have a similar concept of self-service technologies to those offered by the company.

Question 5. Behavioral intentions:

It is highly probable that I will use this SST again

The likelihood that I would recommend this self-service technology to a friend is high.

If I had to do it over again, I would make the same choice.

Results:

First, The findings supports previous research that forced use of SST increases technology anxiety.

Second, The finding that forced use is negatively related to technology trust and is consistent with prior studies related to forced use of SST.
Third, findings indicate increased technology anxiety leads to lower technology trust.

Fourth, the findings indicate that customer satisfaction significantly decreases when technology anxiety increases.

Fifth, the study found that the effect of technology trust on customer satisfaction with SSTs is positive and significant, implying that trust in SSTs is important in consumers’ positive feelings from a service encounter.

Lastly, the study concluded that customer satisfaction was positive element in behavioral intentions.

Results indicated that the two intermediate psychological constructs of technology anxiety and technology trust which affect satisfaction and the behavioural intentions to use TBSS.

The study highlights the relationship between forced use, technology anxiety, technology trust, customer satisfaction, and behavioural intentions toward the adoption of TBSS.

4.6 Literature Review 6.


This review is conducted provide an answer to research question three, to make a comparison between use of TBSS in airlines and other industries.

Summary:

In this paper Castro et al. (2010) research the importance and implications of the advances made in information technology (IT) and the impact it has had on people and industry. The authors examine some of the benefits of TBSS to consumers and to businesses. They also address some of the concerns over self-service i.e. the notion that TBSS will just shift work to the consumer. Another concern is that it will eliminate human interaction and that it destroys jobs and that even if it does increase productivity the benefit will not accrue to employees.
The authors examine the many opportunities these advances have created to leverage self-service technology in many varied industries. Using computers online, airline passengers can buy, book and check in for their flights. Also through the Internet, using a mobile phone, laptop computer or tablet, bank customers can check their balances and transfer funds. On-line shoppers can purchase products without having to go to a store or interacting with sales or service staff.

The authors explore the types of self-service technology currently being used and classify them in the following categories: Electronic kiosks, Internet applications and mobile devices including smart phones, and tablets.

**Types of Self-Service technology:**

Self-Service Technology (SST) is developing rapidly mainly as a result of huge advances in Information Technology (IT) through electronic kiosks, the Internet and mobile devices such as smart phones, tablets etc.

1. **Electronic Kiosks:**

These stand-alone units replace staff attended workstations for customers to access information or perform a service. Wireless networks and broadband network access have made these units a user-friendly and cost-effective option in many service industries.

**Banking** was at the forefront of the use of technology in self-service with electronic kiosks in the form of automatic teller machines (ATMs) first used in the 1970s. Today they are used in almost every country in the world with over 44 billion transactions conducted annually. The ATMs offer customers 24/7 access to their bank accounts especially cash withdrawals and deposits, instead of being restricted to banking hours. This is of particular benefit at shopping centres, airports and other locations where 24x7 access to cash is important for both customers and retailers.

**Supermarket self-checkout** is one of the most frequently used forms of SST that benefits both consumers and business in reducing customers waiting time in a queue to checkout. With one employee able to manage around twelve self-checkout stations, it has also reduced employee theft due to fewer employees handling cash transactions.
and has not increased the incidence of in-store customer theft.

**Digital Photograph Printing** is another of the globally used electronic kiosk applications of SST. The reduction of cost and increased speed of production facilitates customers to process their own high-quality prints from digital images in a very short time. Editing of photographs can be achieved simply with cropping and adjusting of colours including conversions to black and white and sepia tones. Castro et al. (2010) sighted the Eastman Kodak Company, 2009 that by 2009 Kodak had installed over 100,000 photo kiosks globally.

**Airline Airport check-in kiosks** have significantly speeded up the flight check-in process, it is more efficient and cheaper than processing passengers using only airline check-in agents. Passengers check themselves in, produce boarding passes and baggage tags (if required) and then take their baggage to a baggage drop area. At Charles de Gaulle Airport in Paris, Air France is introducing self-boarding through an automated turnstile at the boarding gate (Figure 7).

![Source: (Castro et al., 2010) Self-boarding gate, Paris Charles de Gaulle Airport.](image)

**Government Departments** at airports are also using SST combined with biometric enhanced passports. At some Australian airports The Australian Government has introduced “Smartgate” immigration processing kiosks. This facility permits Australian and New Zealand e-passport holders to process themselves through passport control using the “Smartgate” kiosks. This facility will be gradually extended to passengers of other nationalities whose passports comply with the International Civil Aviation Organisation (ICAO) - compliant e-passports.
There are many other organisations/services employing Electronic Kiosks such as self-service petrol stations, self-pay parking and tolls, food ordering kiosks, postal kiosks, electronic voting (in some countries) and information kiosks to name just a few.

2. Internet Applications:

Internet Technology has enabled consumers to access information not previously available to them without the assistance of human service interaction to obtain information for them. Through the Internet consumers are able to search for and participate in many different forms of self-service activity.

**Online Banking**, like ATMs, has significantly reduced the number of in-bank tellers to service customers’ banking needs. A great number of banking transaction types are now available through online banking via the Internet. Money transfers to other accounts within the same banks or at other banks and a facility to pay bills (accounts). In Australia the electronic bill payment system (BPAY) is now available to customers. These facilities are all available from the comfort of home or the office on a 24/7 basis without being restricted by normal banking hours.

**Retail E-Commerce** has a rapidly growing share in some sectors of the retail market especially in retail sectors like tickets for events, books and electronics are particularly strong in online sales. Department stores are now also selling their products online in competition with online warehouses that were able to sell the same or similar products at a much-reduced price.

Paper airline tickets, once almost exclusively sold through retail travel agencies or airline retail sales outlets (ticket offices or travel centres) have now almost disappeared. Airline tickets in e-ticket form are available to be purchased online by the customers direct from the airlines’ web sites or an online travel company or by visiting a travel agency. Not only are these e-tickets cheaper to produce and process than the paper variety, in case of the loss of an e-ticket print out, they are easily replaced and avoid the stressful and lengthy procedures that previously accompanied the lost ticket indemnity (LTI) process. Castro et al. note that the International Air Transport Association (as sighted in IATA, 2013) advise that as of May 2008 it had reached 100 percent compliance in the use of e-tickets by its members which
represent around 93 percent of the world’s airlines. There are many other areas where online services are replacing the traditional face to face interaction with customer service staff, to mention a few: online health, e-learning, some professional services and access to government services.

**Mobile Devices including smart phones:**

The importance of mobile devices is growing rapidly with the advances made in third and fourth generation (3G and 4G) wireless networks, which enable mobile devices to access multi-media content. Browser enabled smart phones provide the fastest growing access to internet-based applications used in commercial or financial transactions as well as a variety of other self-service functions. Mobile phone check-in has been developed by airlines that includes the receipt of an electronic boarding pass that can be displayed on the smart phone screen and containing two-dimensional bar code able to be scanned at the boarding gate (Fig. 8).

![Fig. 8. An electronic boarding pass with a two dimensional barcode on a smart phone.](image)

Smartphones can also be used as “electronic wallets” i.e. a multi functional device enabling contactless payments, storing information and having identification, authentication and communication functions. The smartphone uses near field communication (NFC) technology, which is a specific standard of Radio Frequency Identification (RFID) technology that can securely transmit data wirelessly over short ranges be- tween electronic devices.

In Japan and South Korea smart phones are used by consumers as electronic credentials to check-in to their offices, apartments and health clubs. Students use them
to mark their attendance at schools by touching their phones to readers outside
classroom doors.

**Benefits for consumers:**

The authors note the following benefits for consumers in the use of TBSS: the option
of choice, greater convenience (24/7 availability), ease of use and importantly lower
prices. Prices can be reduced when SST is used, as there are less paid service staff
members utilised reducing the overall cost to the merchant.

**Benefits to Business:**

The investment by companies in self-service technologies is primarily for cost
reduction, they also believe it enables them to provide a more efficient streamlined
service. By freeing up workers normally involved in face-to-face customers service
functions, they may be redeployed to other jobs in more productive and profitable
areas or made redundant to reduce labour costs.

**Concerns over self-service:**

The authors address four major concerns that have been raised about the increasing
use of Self-Service relative to this research. They include that self-service only
transfers most of the work to the consumer; that it eliminates the choice for consumers
and deprives them of human contact; and that self-service eliminates the need for
many jobs.

**Concern 1. Self-service simply shifts work to the consumer.**

The implementation of self-service is seen by some as only benefitting the company
through having more work performed by the consumer. The authors contend that this
is seldom the case as the benefits generally accrue to the consumers in the form of
reduced prices and greater convenience.

Overall SST generally means less time spent on a service process by both the
consumer and service staff. Continuing advances in SST should mean that the self-
service process becomes even more user friendly.
Concern 2. Self-service eliminates consumer choice and robs individuals of human contact.

The authors contend that in most cases the option of traditional service is still there and refute the complaint by some customers that they are robbed of choice. For example, banks still have tellers to perform transactions for customers, airlines still have the traditional service staff manned check-in counters and supermarkets still have service staff manned checkout counters.

The authors with a historical reference addressed criticism that SST robs individuals of human contact i.e. that the same criticisms were levelled when elevator operators and operator connected phone calls were abolished. After initial complaints about the loss of the human touch performing the functions previously performed by operators direct with a machine became the preferred option.

Concern 3. Self-service destroys jobs.

Castro et al. (2010) also compare concerns about the loss of jobs resulting from the introduction of SST to historical events. Ever since factory automation in the early 1960s concerns have been expressed about a loss of jobs due to greater automation in industrial processes. Both historical and academic analyses have shown that increased productivity through automation or self-service does not lead to higher or long-term unemployment. In Fact the authors maintain that companies providing self-service technologies will create more high-skilled jobs. Even if some low-skilled jobs are eliminated there will be an overall shift to higher-skilled and better-paid jobs.

Castro et al. (2010) found that the benefits of SST accrue to both consumers and business and include lower costs, lower prices and more convenience, whether from ATMs, e-commerce or via mobile payments. While SST is already widely used, with continued advances in IT SST will continue to be improved and be applied to many more areas of industry and service entities.
4.7 Survey Review.


This review is conducted principally to assist in answering research question four but also has application to results for research question one.

To determine passenger preference for Internet and automated check-in facilities in preference to counter and kiosk forms of check-in, the International Air Transport Association (IATA) carried out an independent survey in June/July of 2013. Respondents to the survey were solicited through social media, via email and by word of mouth. More than 140 countries participated in the survey with almost 8,000 respondents. The results were a reflection of regional and global preferences for passenger check-in, they are shown in graph #1 below.

The results show that an overwhelming majority of passengers preferred Internet self-service and automatic check-in facility over the other forms of self-service with the self-service mobile the next most popular. The traditional counter check-in option was next with airport kiosk self-service being the least preferred.

Graph #1 Preferences of check-in modes (IATA passenger survey, 2013).
The IATA survey also researched the various methods of passenger bookings with the following results:

Of the passengers surveyed, fifty per cent booked their flights through the Internet on an airline website, seventeen per cent used the Internet to book with an online travel company, three per cent used mobile applications, nineteen per cent still booked in person at a travel agency and twelve per cent replied that they did not know.

A global demographic perspective of the IATA passenger survey is shown in the graph #2 shown below.

Results showed the highest number of respondents (thirty per cent) came from the Asia-Pacific region with Europe second at twenty eight per cent and North America third with twenty six per cent. Thirty one per cent of respondents were between the ages of 25-34 and twenty three per cent between 35-44. Males represented fifty nine per cent of respondents compared with forty one per cent females.

Graph #2, Global demographic perspective of the IATA passenger survey (IATA, 2013).
CHAPTER 5

DISCUSSION

Overview:

In this section a critical analysis of the literature review is provided relating to each of the four questions that provided direction to the research. Several of the reviews have relevance to more than one of the questions and are used in answering those questions. Some of the review results were similar in their findings especially in the findings for question one where they spanned across literature reviews one to four.

Even though some of the research in several of the research papers was not exclusively airline related (in some cases not at all), the principles apply to the basic philosophy of TBSS use and therefore relevant to be applied to airlines and their passengers.

5.1 Research question 1: What are the factors involved in the adoption or rejection of TBSS by airline passengers?

Research by Dabholkar (1995) appears to be the foundation for the research of many of the researchers on this subject as her work is referenced constantly in their work. The attribute model proposed in Dabholkar’s (1995) paper "Consumer evaluations of new technology-based self-service options: an investigation of alternative models of service quality" is adapted in various ways by others. Four of the five attributes identified by Dabholkar (1995) in her attribute model were referenced individual findings by other earlier researchers, these are; speed of delivery as sighted by (Maister, 1985), Reliability (Van Gorder, 1990), Enjoyment (Davis, Bagozzi & Warshaw, 1992) and Control (Langford et al. 1981, & Bateson & Hui, 1990).

The attribute models proposed by Dabholkar, (1995) and Walker et al. (2002) to determine the levels of adoption or rejection of TBSS both alluded to the importance of speed of delivery, ease of use, reliability, enjoyment and control although some were expressed in different terms. A possible problem with the identification and measurement of five attributes is that they may not always be the five most important characteristics to each of the respondents (Rogers, 1995).
Wang & Namen, (2013) also supported and expanded on the Dabholkar (1995) attribute model and sighted three of Dabholkar’s major concepts of behaviour as having an impact on the adoption or rejection of TBSS. Their first behaviour concept comprised of three of the innovation attributes proposed by Dabholkar (1995) including perceived risk (substituted for reliability), plus the additional attribute of relative advantage i.e. the level of perceived advantage or superiority over the process that it supersedes or is pitted against.

The second behaviour concept proposed by Wang and Namen (2013) is one of common characteristics such as attitude towards technology, interaction with service employees and including demographics such as age, gender and education.

Their third proposed behaviour concept was one of situational factors relating to time pressure, length of queues and crowded environments. “When users perceive the departure area as being overcrowded, the use of the SST increases. Queues of passengers waiting to be checked-in result in more uses of the automated check-in process” (Gelderman, Ghijsen & van Diemen, 2011, p. 418). This argument is in support of the findings by Meuter et al. (2000), however, it is in contrast to the findings of Oyedele & Simpson (2007).

Walker et al. (2002) in their model present how the relationship between capacity and willingness leads to adoption. It demonstrates how the other attributes, a mixture of the attributes sighted by Dabholkar (1995) and those by Wang & Namen, (2013 ) affect both capacity and willingness and become determinants in adoption or rejection of TBSS.

While Brunger’s (2008) research is principally concerned with the impact of the Internet on airfares it also addresses other uses of the Internet in airline processes. Brunger examines customers’ behavioural attributes and how they influence satisfaction with TBSS. Brunger’s comparison between internet distribution and the traditional airline/travel agent distribution system reveals several of the same characteristics as the models by Dabholkar (1995), Wang & Namen (2013) and Walker et al. (2002) those of accessibility (24/7), control and ease of use.

Although not reviewed in-depth, Curren and Meuter (2005) in their research entitled "Self-service technology adoption: comparing three technologies" proposed an SST
attitude/intention to use model Fig. 9 which is not dissimilar to Dabholkar’s (1996) model

![Diagram](image)

Fig. 9. Source - Curran and Meuter (2005) SST attitude/intention to use model.

In the Curran & Meuter (2005) model, Ease of use, a need for interaction, Risk and attitude toward SST were adapted from Dabholkar (1995) while usefulness was adapted from Jackson et al. (1997). The Curran and Meuter research concluded that the perception was that online SST had a greater risk factor than kiosk SST, however that ease of use and usefulness were the more significant predictors of SST use.

Research and Data collection methods varied between the different researchers. They ranged from the use of undergraduate students being used in a fast-food restaurant scenario (Dabholkar, 1995), questionnaires, open based interviews (Wang & Namen, 2013), focus groups (a pilot study and empirical study) (Walker et al., 2002) and in-depth one on one interviews (Brunger, 2008).

The size of the samples in the four research papers were relatively small surveys totalling only 877 respondents of which 53% were female and 47% male.

While the results in some areas varied, there was a common theme throughout the four different surveys the majority of research findings that control, ease of use and relative advantage were prominent determinants in the adoption of TBSS.

In contrast to other researchers findings, Dabholkar (1995) did not find that speed and reliability were major factors in TBSS adoption. Perhaps this is not surprising given that the respondents in that research scenario were all college students. This is in contrast with Walker et al. (2002) whose findings were that perceived reliability ranked high with ease of use (capacity) as a determinant in TBSS adoption, his group of respondents included 70 per cent of persons of between 30 and 60 years of age.
The breakdown of female to male respondents was 53 per cent female to 47 per cent male and 77 per cent of the total under 40 years of age and 23 per cent over 40. Dabholkar (1995) found that 85 per cent of respondents had high school diplomas or higher education qualifications, not surprising since the respondents were all college students. Interestingly Wang and Namen (2013) found that a relationship between education and TBSS adoption was not established and this will need further research.

Demographics did not figure prominently in all of the literature researched. The findings that related to the importance of demographics were in contrast with research conducted by Harteveldt (2012) who found that Gen Y passengers who grew up with the Internet at home and school were very familiar with high-speed connectivity and the use of laptop computers and mobile phones. With this technology part of their daily lives, it gave them the perspective that Internet access is immediate, easy, and omnipresent.

There is a group in the middle age generation who are more reticent in adopting the self-service concept. Although interestingly, in amongst the senior age group there is also a tier of retired people who have made themselves familiar with the new technology and who have become adept at using self-service. They have become known as “silver surfers” (Amadeus, 2005). Another different view of the importance of demographic characteristics was by Meuter et al., (2002) who found that technology anxiety was a better predictor of self-service usage than age and gender.

Furthermore, Lu et al. (2011) conducted a study of American, Australian, Korean, and Taiwanese passengers in the behavior of passengers using airline check-in services. Through the data they collected they found an indication of cultural bias in that Korean, Australian and American air travelers were more likely to use self-service check-in facilities but that Taiwanese passengers prefer to use the conventional counter check-in service.

Walker et al. (2002) found that while respondents did not seek personal interaction with service staff, adoption levels of TBSS rose when access to customer service help staff was available. Some only wanted personal interaction in case of a problem or to register a complaint.
Brunger (2008) in his Internet focussed research found that the Internet search portion of TBSS experience was intellectually satisfying (enjoyment) and the 24/7 access aspect and sensation of control were the main reason for adoption of TBSS. Brunger noted that his respondents found that the enhanced control, greater involvement in the processes and improvement in communication meant that there were too many benefits in using TBSS to go back to the traditional service offer of personal interaction.

The response to the question of what the factors are involved in adoption or rejection of TBSS by airline passengers is that findings varied minimally between researchers. However, there was a consensus in the findings that ease of use, a feeling of being in control and relative advantage compared to the traditional service offer were the major determinants in the adoption of TBSS. For Internet self-service process users convenience and the providing of intellectual satisfaction were also major determinants in its use.

Wang & Namen (2012) concluded that situational factors are more likely to influence the decision by a passenger to use SST than any preconceived idea they held about its use. Wang et al. sights the example of a passenger who would not normally use the airport self check-in facility but who decides to use the SST function if at the time of check-in there was congestion at the check-in counter manned by service staff.

Equally important, when passengers have a negative experience with TBSS they will often decide against using it the next time they travel. However, when the experience is positive they will have the confidence to commit to using it on future occasions (Bitner, Brown, and Meuter, 2000).

A perceived lack of expertise in IT or a need for personal interaction mainly by older passengers is seen as a factor in rejection of TBSS (Castillo-Manzano & López-Valpuesta, 2013).

Meuter, et al. (2000) proposed four key factors in the rejection of TBSS.

1. **Technology failure** – a malfunction of the technology during an interaction by a passenger with machine or software.

2. **Process failure** – e.g. a failure in the Internet reservation to confirm a booking or in the check-in process a failure to allocate a seat number.
3. **Poor design** – e.g. a user un-friendly process with too many limitations or ambiguous or difficult to understand instructions.

4. **Customer-driven failure** – failures caused by customers’ own actions but rarely admitted and usually blame on technology e.g. incorrect inputs or passwords.

The results of the IATA Global Passenger Survey of 2013 (Graph #1) seem to be consistent with other research which found that there is a high level of adoption of TBSS especially in the various processes using the Internet.

**Summary:**

The research indicated that the principal factors for adoption of TBSS were the 24x7 convenience of the Internet, the perceived feeling of control, ease of use, relative advantage and situational factors such as time pressure, waiting time and crowded environments. On the other hand the factors related to rejection of TBSS were a perceived lack of expertise (especially among older passengers), technological failure, process failure, poor design and forced use of TBSS.

5.2 **Research question 2: Does the loss of interpersonal service as a result of TBSS outweigh its benefits and affect customer satisfaction?**

Parasuraman (1996) found that the replacement of interpersonal human contact in the traditional service encounter with a human to machine interaction presented a fundamental shift in the nature of services.

Beatson, Lee & Coote (2007) found that a reduction in personal contact through self-service technology had the potential to affect assessment of consumer satisfaction and commitment. This seems to be in agreement with the findings of Bitner, Brown & Meuter (2000) who argue that the main determinant in customer satisfaction with the traditional service encounter was found to be the interpersonal interaction between passenger and customer service personnel.

In this context Bitner et al. (2000) suggest that if there is a decrease in interpersonal interaction and if the customer’s total experience is to remain positive. The customers’ satisfaction levels must be enhanced through the effective use of technology. Unless this is achieved TBSS will be seen as being designed for the technicians instead of customers.
Catillo-Manez and Lopez-Valpuesta (2013) found that passengers over 65 years generally prefer human interaction when purchasing tickets or checking-in for flights. Conversely, passengers under 30 years of age prefer online ticket purchase and check-in in preference to the traditional service offers.

This supported by Lu et al. (2011) who also found that older passengers are more reluctant to use online and kiosk self-service check-in than business travelers, online ticketing users, frequent flyers, and younger passengers. The reasons proposed were that the older passengers prefer the traditional service offer of interaction with service employees while those preferring TBSS are less anxious due to their familiarity with IT and have less need for personal contact.

Although there may not be any interpersonal contact with a technology-based self-service, it should not be automatically assumed after the introduction of an Internet-based self-service that customers would not be pleased. Customers who choose to use the TBSS option may not receive the interpersonal (and sometimes friendly!) interaction of the traditional service encounter (Lui et al., 2003) but may well remain loyal customers.

Bitner, et al. (2000) suggest that forcing customers to use technology-based self-service without other viable options is a dangerous strategy. Liu (2012) through his research determined that in most age groups forced use of SST exacerbates technology anxiety and negative technology trust (both mediating factors in satisfaction with SST). As technology anxiety is already higher in the over 55 years age group this induces an even greater negative attitude towards the technology.

The question of whether the loss of interpersonal service as a result of TBSS outweigh its benefits and affect customer satisfaction does not have only one answer, it depends on several factors. From the research it is clear that older passengers, less conversant with IT processes and have some technology anxiety and trust issues with TBSS will often prefer and are more satisfied with the personal interaction of the traditional service encounter. Younger passengers who have grown up with IT processes and have no such technology or trust issues are more satisfied with the TBSS options. It can be argued however that forced use of the technology can dissatisfy both groups especially the senior group and therefore may outweigh the perceived benefits.
Summary:

The indication from the reviewed literature is that the loss of interpersonal service affects the satisfaction levels of some passengers. It is evident that those passengers less conversant with IT processes (among them older passengers) will have some technology anxiety and trust issues. These passengers are more likely to prefer the traditional face-to-face service encounter. Forced use of TBSS is also deemed to negatively affect the satisfaction level of passengers.

5.3 Research question 3: How does airline TBSS compare with other industries’ use of TBSS?

Research by Castro et al., (2010) found that Technology-Based Self-Service is transforming many industries, from the use of ATMs in the banking industry to the use of e-commerce in retail and many other industries/businesses including the travel industry. TBSS has led to the emergence of new business models based on Information Technology-enabled self-service, facilitating customers to provide many of their own services. As SST becomes more efficient and accessible, business uses SST to operate more productively while continuing to satisfy their customers (Castro et al. 2010).

The TBSS process is regarded differently from automation in that the automation process reduces the number of functions carried out by employees and indeed reduces the need for the number of employees previously employed. The technology-based self-service process however allows the customer to perform the tasks previously performed by a service employee. Banks and airlines use both self-service kiosks and the Internet for self-service processes to transact business. The Internet facilitates airline passengers to research and plan their business or vacation journeys by preparing their own itineraries, booking flights, reserving seats and checking-in for their flights.

Airlines also use market segmentation to decide on the positioning of their service offers. Companies to identify the social class, lifestyles, opinions, interests, behaviour and attitudes of their customers, use modern communication systems. This not only lowers distribution costs but also enhances their brand and gives them closer contact with their customers. It enables the airline to target promotions and services at market
segments most likely to respond positively to them (Business case studies, 2014).

More recently mobile devices such as smart phones are also used to carry out many of these self-service functions and through their use eliminate the necessity for any non-electronic material to be used in the processes e.g. verification of e-tickets and boarding passes. Being trialled by British Airways (BA) are re-usable permanent electronic baggage tags for regular travellers (Airlinetrends.com) see Figure 10.

Fig. 10. Re-usable electronic bag tag. (source: Airlinetrends.com)

The procedure for using an electronic bag-tag is simply that after booking their flight their booking details are sent to their smartphone using a British Airways application (APP). After using their smartphone for check-in and receiving a seat number and electronic boarding pass the APP will update the electronic bag-tag with a unique two-dimensional barcode. This barcode contains identification numbers and flight details. The barcode will be changed each time the passenger checks-in for a new flight.

The BA trial followed the Qantas’ (QF) introduction of its “Q Bag Tag” in 2010. These personalised Radio-Frequency Identification (RFID)-embedded tags were provided to QF frequent flyers, they were linked to their loyalty account and held passenger details and the flight information for their current flight (Airlinetrends.com, 2014). In the Global Passengers Survey (IATA, 2013) fifty three per cent of passengers selected the use of a permanent luggage tag as their preferred option of tagging bags prior to flight.

Summary:

The research by Castro et al., (2010) and information taken from Airlinetrends.com (2014) confirms that compared with other industries airlines are at the forefront in the use of TBSS. The high-tech nature of the aviation industry and the variety of
processes to which TBSS can be applied both commercial and operational attest to this. These processes include travellers planning their own itineraries through the point of sale process (producing e-tickets), making flight reservations and then checking themselves in for a flight and producing boarding passes. All this can be achieved via the Internet without attending an airline or travel agent office.

5.4 Research question 4: Do passengers view Internet self-service check-in option differently than airport kiosk check-in.

In industries, businesses and government services Kiosk self-service is the most common and popular mode of self-service, e.g. in banking (ATMs), supermarket check-outs, self-paying parking fees and road tolls as well as digital photograph printing and the other numerous service areas using TBSS.

In air travel Internet and kiosk check-in are regarded different from airport counter check-in service as they both lack human interaction and they are both easier to access than airport counter check-in (Lu, Choi, & Tseng, 2011). However there is a further differentiation in that both airport counter and kiosk check-in are only available at the airport whereas web check-in is available wherever there is access to a computer (and a printer if a printed boarding pass is required). Using the web (Internet) check-in facility there are no queues and the process can be performed up to twenty-four hours before departure.

The widespread use of the Internet and wireless devices and the development of mobile applications to facilitate self check-in is expanding rapidly aided by easy access to WiFi in public places such as airports. In the face of these technological advances the airport check-in kiosks are losing popularity and smartphones and other mobile wireless devices will be the principal means for passenger processing beyond 2015 (IATA, 2012). These are the major points of difference between the way passengers view the Internet and airport kiosk check-in options. This is confirmed by the results of an IATA (2013) global passenger survey shown in graph 1 which shows that the airport kiosk is already the least preferred check-in option compared with Internet check-in, automated check-in, mobile phone self-service check-in and is even less preferred than counter check-in.

Further streamlining and simplification of the check-in process may be possible using
Near Field Communication (NFC) technology that may facilitate an even more efficient and automated form of check-in. NFC facilitates one device, normally a mobile phone, to pick up data from another device or NFC tag at close range. It is similar to Bluetooth, except that instead of programming two devices to work together, they can simply touch to establish a connection (Amadeus, 2011).

**Summary:**

Whilst in most service industries and Government services self-service kiosks are the most common form of TBSS utilised it is clear from the results of the IATA Global Passenger Survey (2013) that in aviation the self-service kiosk is the least popular option for check-in. The Internet and automatic check-in options were revealed as the preferred choice of passengers.

**5.5 Discussion of the Research Aim**

The study of research literature, aviation industry surveys and reports relative to the topic of TBSS in airline processes indicate that the impact on passengers is predominantly positive. There are a number of factors that need to be taken into account when assessing the current and future impact of TBSS on airline passengers. Included are: (1) Company cost savings versus perceived passenger benefits. (2) The risk of improper implementation of TBSS. (3) The effect of a loss of human interaction. (4) The Internet facilitates the passenger to easily make comparisons of different offers. (5) The expectation of passengers to be kept constantly informed.

The airline view is that TBSS is a cost-effective way for airlines of providing a standard of customer service. The contention is that passengers receive the benefits of convenience of 24/7 access, time saving, a feeling of control and can even avoid at times, a judgmental attitude from Service representatives (Meuter et al. 2000). However, there are risks associated with these technology-based encounters if they are not implemented appropriately, which may frustrate and intimidate users (Walker et al., 2002). Forcing TBSS on passengers may create hostility and resentment leading to a lower perception of the airline’s services (Liu, 2012). Therefore the perceived gains and benefits to airlines of technology-based self-service encounters need to be weighed-up against how the customers perceive and react to them.
It is very important for airlines to understand how self-service technology impacts on its passengers. It is important for the development of marketing strategies given the challenge it provides for the traditional service offer and the implication that human interaction between customer and staff is no longer essential (Meuter et al., 2000). The airlines websites and associated Internet travel company websites are therefore particularly important in facilitating passengers’ purchase of travel products.

Using the point of sale self-service facility on the Internet, passengers have the choice to visit multiple websites (airline sites and Internet travel company sites) to search for destinations, airlines that serve them, fares and make comparisons between the various options. The IATA global passengers survey (2013) found that 71% of passengers visit more than one website before purchasing air travel and 63% compared multiple websites before making their decision to purchase.

The growth of “ancillary services” has increased dramatically in the past three or four years. This “unbundling” of fares and consequential collection of ancillary revenue that was previously limited to Low Cost Carriers (LCCs), has become a priority for many airlines. Ancillary revenue includes passenger baggage charges, reservations cancellation/change fees, priority seating and frequent flyer fees. Data from airlines who disclose their ancillary revenue shows that it has grown from 23 airlines and US$2.45 billion in 2007 to 53 airlines and US$27.1 billion in 2012 (IdeaWorks, 2013). The Internet facilitates the payment of most of these ancillary charges and fees prior to check-in and are now just part of the self-service choices offered.

In this age of mobile computer devices the smartphone is already more powerful than the super computers of the 1970s (IATA, 2012). The introduction of the Apple iPhone in 2007 represented a major change in revolutionising the mobile phone market. Passengers are no longer satisfied with a just a mobile phone but demand the facility of browsing the Internet from wherever they are. The relatively new mobile (smartphone) check-in option is gaining popularity especially among the younger generation (IATA, 2012). Tablet computers such as the Apple iPad introduced in 2010 bring a new innovation to mobile computing, previously confined to laptop computers. The tablets have touchscreen interfaces and downloadable applications the same as in a smartphone.
The age of instant information via mobile computer devices means that travelers are always connected and expect to be constantly informed about any issues related to their travel plans (Amadeus, 2011). The different ways of using TBSS each have different levels of support as the IATA (2012 & 2013) surveys indicate. There was a significant positive indication of a preference for Internet and automated check-in over kiosk and counter check-in. From the literature research results discussed in this Chapter indications are that overall the impact of TBSS on airline passengers is generally positive, from passenger surveys it is evident that TBSS is a preferred option for many airline passengers of today (IATA, 2013). The next Chapter, therefore, moves on to discuss the implications for management of the research findings and the possible direction for future research.
CHAPTER 6

IMPLICATIONS AND FURTHER / FUTURE RESEARCH

Chapter overview

To encourage greater use of TBSS and its related benefits airline management should consider the implications noted in 6.1. These implications include: (1) Employee self-service support training. (2) Disruption handling. (3) The impact of social media. (4) The opportunities and challenges of advances in technology. (5) Keeping a balance between TBSS and interpersonal service.

Researchers may consider the observations about future research and direction that include: (1) Continued advances and innovations in technology. (2) How the frequency and extent of TBSS will impact on loyalty and brand commitment. (3) The impact of future advances in TBSS on employees.

6.1 Managerial Implications

Traditionally, service employees have been essential elements in the service encounter and despite the greater customer participation in the TBSS encounter frontline employees remain an important element in consumer satisfaction. Since the level of self-service is likely to increase, a whole new area of challenge in customer support will present itself. There will be an increasing need for employee training in self-service support roles and consideration could be given for a move to change the role from service delivery employee to one that specialises in self-service assistance and self-service failure recovery. There is perhaps also a need for the provision of retraining programs for workers whose positions are affected by technological change.

One downside to reduced staff levels resulting from the increased use of TBSS is that during service disruptions staffing appropriately to handle a disrupt situation becomes more difficult. These disruptions can range from adverse weather conditions or aircraft mechanical breakdowns to major computer outages. Depending on the severity of the service disruption, check-in and other departure control functions may have to be performed manually. The challenge for most airlines will become a matter of providing sufficient numbers staff with the required level of expertise during such
For airline management an understanding of the impact of social media is crucial. Customer complaints are now promulgated across the passengers’ social media contacts and can influence many current or potential customers. Globally Facebook and other social media facilities now have over 500 million users i.e. one in every thirteen persons on earth (Amadeus, 2011), the impact that this global social media explosion is having an influence on travellers worldwide and cannot be ignored. According to a recent study commissioned by Global Distribution System (GDS) Amadeus, which covered respondents from across five regions of the world, over 60% of travellers worldwide use social media travel related sites (Amadeus, 2011).

Smartphones and tablet computers provide a unique platform for customer interactions. These mobile devices are already becoming standard equipment for most frequent travellers. Airlines will need to ensure their websites’ are optimised for the mobile Web. Given these mobile devices’ ability to integrate multiple functions to expand the experience of the user, airlines need to ensure development of applications that optimise the potentials of this technology. They should create innovative applications that exploit the advantage of all aspects of TBSS and deliver the optimum level of services to all of an airline’s passengers in particular its regular and loyal customers (Amadeus, 2011).

The advances in technology have presented both opportunities and challenges for airlines. There are opportunities for airlines to reduce staff and save labour costs but at the same time they face the challenges of their passengers’ demand for information and services delivered on their preferred personal computing device (Amadeus, 2011).

To completely do away with the traditional service offer of interpersonal interaction should not be the sole goal for companies in introducing TBSS, but rather the provision of convenient, efficient and user-friendly self-service facilities, both TBSS and a human interaction option. Customers want a choice of the way in which they interact with a service company and do not like to be forced to use only one service option. Providing customers with a variety of service delivery options can enhance customers overall experience by giving them a sense of control. It is therefore important for service companies to keep a balance between TBSS and the traditional
interpersonal service (Wang, 2012).

Customers seen as “partial employees” providing their own service, may be deemed to be a less expensive resource than company employed service staff, however “managing and training” them may also be more difficult plus they can also be an influence on other customers (Hilton, Hughes, Little, and Marandi, 2013). Will companies still be able to manage the absence of customer support staff and still continue to offer service levels of a quality that increasingly well informed customers demand (Beatson et al., 2007)?

From the findings and discussion the implications for managing current and future technology-based self-service are that airline management will need to consider passenger satisfaction, confidence with, and perception of Technology-Based Self-Service to ensure their customers’ needs are met. They will need to identify the relevant technologies that help to enhance the customers’ experience. In future airlines may not actually have human interaction with their passengers until they are on board the aircraft (Amadeus, 2011). Airline managers should do more to effectively plan and manage SST introductions by focusing on the critical factors that impact passengers and manage their frustrations and improve customer satisfaction.

### 6.2 Future Research Direction

As advances are continually being made in technology, the level in the use of self-service will inevitably also continue to increase, especially in service industries. Trends indicate that as the technology becomes even more advanced and innovative so will the opportunities for future/further research increase (Anitsal & Paige, 2006).

Meuter, Bitner, Ostrom & Brown (2005) argue that consideration should be given to the importance of substituting TBSS for the traditional service of interpersonal interactions as it may have long-term implications. These human interactions have traditionally been viewed as important in the establishing of trust and loyalty. Future research could explore the influence of SST usage on consumer revenue, loyalty and ultimately profitability. Stockdale (2007) agrees with this argument and believes research to investigate how the frequency and extent of SST usage impacts on organisational outcome variables such as loyalty and brand commitment.
For management, an understanding of the impact and consequences of technology on service encounters is not only with relevance to passengers and their relationship with airlines, but also the effect it has on employees previously involved in the traditional service encounter. “Therefore, comprehending self-service technology and its impact on the service encounter is only one step toward understanding the broader impact of technology in the marketplace” (Beatson, Lee & Coote, 2007, p. 87).
CHAPTER 7

CONCLUSION

The purpose of this research was to investigate the impact of TBSS on airline passengers. To better understand the phenomenon of TBSS four research objectives were proposed as questions, the answers to these questions attest to the achievement of the aim. Although some of the research was not directly airline industry related it was relevant as it related to the use of TBSS in service industries.

The literature reviews conducted spanned a time frame of some twenty years commencing during the mid 1990s beginning with Dabholkar’s (1995) research. There are similarities between the attitudes expressed in research by Dabholkar (1995) and those described by Walker et al., (2002) and Wang & Namen (2013). Findings from Dabholkar’s research formed a common thread in much of the subsequent research conducted by others into the factors affecting adoption or rejection of TBSS by airline passengers.

The attributes, ease of use and sense of control considered as important factors by Dabholkar in adoption or rejection of TBSS appeared as significant findings in much of the research by others. There were contrasting opinions on the importance of some attributes e.g. speed and reliability between Dabholkar (1995) and Walker et al. (2002). This seemed to be based more on the perception of speed i.e. waiting time as opposed to the speed of the actual self-service process vs the traditional service offer.

There was also a difference of opinion about demographics as a factor in rejection or adoption of TBSS between the research findings of Wang & Namen (2013), Harteveldt (2012) and Castillano-Manzano et al. (2013). Furthermore, Lu et al. (2011) found a cultural bias in check-in preferences between Caucasian and some Asian respondents.

From the research material the factors that were most sighted as important in the adoption of TBSS were the 24x7 accessibility via the Internet, the feeling of control, ease of use, the range of choices (in arranging and buying of travel) and the convenience of being able to do it from almost anywhere where there is Internet access. It is also evident from the research that the use of the Internet for most of the
aspects of in air travel from the point of sale functions of planning, booking, ticketing to the check-in for flights is accepted and used by the majority of airline passengers. This is confirmed by the IATA Global Passenger Survey (Graph #1).

Whether the loss of interpersonal service due to TBSS outweighs its benefits and affects customer satisfaction resulted in some expected findings. Most agreed that the replacing human contact with machine interaction did present a basic change in the way service was viewed. While human contact was seen as a determinant in satisfaction with TBSS it was found that some passengers only found it important to have human contact when they required assistance or wanted to make a complaint.

However, it was found by most researchers that older passengers (over 60 years) were generally more satisfied with and preferred the traditional service offer of human interaction. This was found to be largely due to a lack of confidence in their own capacity to use IT functions. Younger passengers (under 40 years) on the other hand preferred and were more satisfied with using the TBSS options. These findings are not surprising and probably expected.

Several researchers found that one important reason for dissatisfaction with the use of TBSS was when it was “forced” on customers without the provision of an alternative option. While this applied to most age groups it was particularly relevant in the over 60 years age group where forced use of TBSS would likely result in a negative attitude to its adoption.

Bitner et al. (2000) found that if customer satisfaction is affected by a decrease in interpersonal interaction airlines must find a way to make the technology more “user friendly” if the customer’s total experience is to be positive. TBSS should not be seen as being designed for the airline’s technicians instead of its customers. To quote the actor and comedian John Cleese, “Technology frightens me to death. It is designed by engineers to impress other engineers. And it always comes with instruction booklets that are written by engineers for other engineers”.

In comparing TBSS in airlines with other industries Castro et al. (2010) found in their research that the use of Internet based technology in self-service was transforming many industries. These include the banking industry, supermarkets, retail sales (through e-commerce), government services, airlines of course and numerous others.
Benefits were found to accrue to customers and business alike. They included lower prices and more convenience for customers and lower costs for businesses. The level and wide range of Internet-technology based self-service used reflects the “high-tech” nature of the airline industry. The range of functions covers commercial as well as operational aspects of customers’ involvement and gives them a high level of control. The control is not limited to operational aspects but also applies in the involvement of planning, booking and purchasing of their travel arrangements. Castro et al. concluded that airlines were at the forefront of industries using technology-based self-service.

When addressing the question of whether the Internet self-service option and the airport kiosks are viewed differently by passengers the IATA Global Passenger Survey (2013) provides an excellent insight in the popularity of the various forms of the new technologies. The survey had by far the largest number of respondents at nearly eight thousand and the results reflected regional and global preferences of the various options.

The results show Internet self-service and automatic check-in (where the airline send a boarding pass to a smart phone or email) were the check-in options preferred by the majority of the passengers. The emerging self-service mobile check-in option proved to be the next most popular and gaining in popularity. The traditional counter check-in option was next with airport kiosk self-service being the least preferred.

Today, many passengers are printing their boarding passes at home and they drop-off their baggage at airport bag drop stations for customers who check-in online. While this helps to reduce airport check-in queue lengths long lines still persist during peak times. This problem is being addressed and could be further reduced by the adaption of another innovation, near field communication (NFC).

The development of NFC will introduce yet another era in technology based self-service. Once ownership of NFC enabled smartphones becomes widespread, airlines can create ways to automatically check-in passengers when they swipe their phone against readers dispersed throughout airports (Amadeus, 2011).

The phenomenal growth in information technology is creating a new era of “passenger-centric” services. In this current age of familiarity with Internet technology, it is a more informed passenger who expects to be kept continually
updated by connecting to a variety of Internet enabled devices to ensure maintaining currency with information pertaining to their travel arrangements. Airlines must endeavour to make maximum use of the technologies and resultant new devices as they emerge to ensure their customers’ expectations are satisfied. As these technologies continue to evolve, airlines must also stay in touch with their passengers’ expectations and ensure they benefit from the innovations the evolving technology provides to improve loyalty and maintain brand commitment.

Initially self-service options were often seen as a substitute for customer service. However, research has shown that many passengers now prefer the Internet self-service options that include check-in. Internet check-in is significantly higher in preference to the airport kiosk check-in option. Passengers prefer the 24x7 convenience of the Internet, the avoidance of long queues in the traditional check-in process and a sense of control over not only the check-in process but many other aspects of their travel arrangements.

The concerns over potential job losses as a result of TBSS has been shown by historical and academic analyses of automation and self-service not to have lead to higher or long-term unemployment in business and industry (Castro et al., 2010).

There are some concerns among less “technically informed” and older customers. However, as shown by the introduction of many other innovations throughout industrial and business history, with time the new practices become the norm and then newer and more innovative processes and solutions to problems will be found to replace them. It is a phenomenon of our modern world that is applicable in many areas of industry and business, particularly in the aviation industry.

The implementation of self-service technology has been the catalyst for the significant transformation that many airlines have undergone in their endeavours to reduce operating costs. The impetus for the adoption of technology-based self-service has been hastened by the rapid emergence of LCCs that adopted the technology very successfully as the basis for their business models (Amadeus, 2005).

A professional looking and efficient user interface has many benefits: customers can spend less time to complete their booking as a result of fewer steps which can not only attract new users but reduce drop-out rates during the transaction process.
Importantly, customer loyalty can also be increased by an attractive and efficient user interface. This is important because customer loyalty can be threatened by the easy access to competitor airlines products and prices through the use of TBSS. One of the major factors of the satisfaction experienced by consumers when they feel comfortable with the online environment is the feeling that self-service gives them control.

The deduction that can be made from the results of the research is that the aim of the research to determine the impact of TBSS on airline passengers has been achieved. The review of academic papers, industry journals, surveys and reports indicate that the impact of Technology-Based Self-Service on the majority of airline passengers is predominantly positive and will become even more so as new technologies are developed and introduced.

“Everyday, the airline industry propels the economic take-off of our world. It is the great enabler, knitting together all corners of the earth, facilitating the movement of people and goods that are the backbone of economic growth. It also firmly embeds us in that striking process of globalisation that is defining the twenty-first century”.


And a cartoonist’s satirical View!!!

Fig. 11. Source: Kudelka, (2008).
REFERENCE LIST


# List of Abbreviations

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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>APP</td>
<td>Application</td>
</tr>
<tr>
<td>ATM</td>
<td>Automatic Teller Machine</td>
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<tr>
<td>DCS</td>
<td>Departure Control System</td>
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<tr>
<td>DTMF</td>
<td>Dual-Tone Multi-Frequency</td>
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<td>E-TKTG</td>
<td>Electronic Ticketing</td>
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<td>GFC</td>
<td>Global Financial Crisis</td>
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<td>GDS</td>
<td>Global Distribution System</td>
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<td>IATA</td>
<td>International Air transport Association</td>
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<td>ICAO</td>
<td>International Civil Aviation Organisation</td>
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<tr>
<td>iPhone</td>
<td>Apple designed smartphone</td>
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<tr>
<td>ISST</td>
<td>Internet-Based Self-Service Technology</td>
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<tr>
<td>IT</td>
<td>Information Technology</td>
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<tr>
<td>LCC</td>
<td>Low-Cost Carrier</td>
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<td>NFC</td>
<td>Near Field Communication</td>
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<td>OTA</td>
<td>Online Travel Agency</td>
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<tr>
<td>RFID</td>
<td>Radio Frequency Identification</td>
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<tr>
<td>SKYPE</td>
<td>A Premium Voice-over-IP Service</td>
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<td>SST</td>
<td>Self-Service Technology</td>
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<tr>
<td>TBSS</td>
<td>Technology-Based Self-Service</td>
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<td>TTA</td>
<td>Traditional Travel Agency</td>
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<td>WiFi</td>
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