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Can self service technologies work in the hotel industry in Singapore? A conceptual framework for adopting self service technology

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**Can self service technologies work in the hotel industry in Singapore?
A conceptual framework for adopting self service technology**

By

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Bachelor of Arts
National University of Singapore
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ABSTRACT

Can self service technologies work in the hotel industry in Singapore? A conceptual framework for adopting self service technology

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The proliferation of self service technologies has changed the way customers interact with service employees and technology. More consumers are now valuing the convenience, consistency, and the control they have over the self service technologies. However, despite the growing popularity of these technologies, hotel industries in Singapore have not embraced self service technologies in their day to day operations. Self service technologies present opportunities for hotels to improve on service standards, and the wide variety of technology applications available allow hotels to choose an application that suits the customers and the hotels needs. To enable hotels to seamlessly adopt self service technologies in the servicescape, this paper proposes a conceptual framework that systematically guides hoteliers through the decision process of implementing self service technologies.

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Part One

Introduction

In Singapore and many parts of the world, technology facilitated transactions have become increasingly popular. There are now a growing number of consumers interacting with technology to create service experiences, and outcomes, which were traditionally performed by service employees. Self service technology (SST) is a term used to describe technological interfaces that allows consumers to produce a service which is independent of direct service employee involvement (Meuter, Ostrom, Roundtree, & Bitner, 2000). SSTs are widely found in various industries in Singapore, including the banking, retail, healthcare, and transport sectors. However, despite the popularity of SSTs, the hospitality industry in Singapore has been reluctant to introduce SSTs to their customers.

It is crucial the hospitality industry in Singapore understand how SSTs can help alleviate the myriad challenges faced by hoteliers. These challenges include the shortage of hospitality workers, the increasing demands from customers to improve current service standards, as well as the pressure from the Singapore government to increase work productivity levels. With the prolific advances in technology, it is likely that SST facilities will continue to develop, and play a more vital role in service delivery and the success of the firm (Beatson, Coote, & Rudd, 2006). Hence, the consequences of overlooking the importance of SSTs can be disadvantageous to the hospitality industry in Singapore in the near future.

In view of the rising popularity of SSTs, this paper studies the applicability and the effectiveness of using SSTs to alleviate some issues faced by the hotel industry. SSTs offer a myriad of opportunities for the hotel industry. Thus, this study will attempt to uncover underlying reasons behind the slow adoption of SSTs, present the advantages of using SSTs,

and recommend a conceptualize framework that will allow hotels in Singapore to implement SSTs at ease.

Purpose of the study

The purpose of this paper is to develop a framework for implementing SSTs in the hotel industry in Singapore. With technology facilitating communication in multiple channels evolving, more firms are now in search of the best combination of technology and human touch to increase current customer satisfaction levels, and to reduce rising labor costs (Makarem, Mudambi, & Podoshen, 2009). The hospitality industry has a wide array of SST applications to choose from; thus far the hotels in Singapore have been reluctant in implementing such technologies to their guests. The paper also explores the reasons deterring the hotels in Singapore from implementing SSTs.

Statement of Objective

The objective of this study is to evaluate the effectiveness of using SSTs in the hotel industry in Singapore. This study will review the current literature, to determine the practicality of incorporating SSTs in the hotel servicescape. With this review of the literature, the hotel industry in Singapore will have a better understanding of SSTs, the consumers' acceptance towards SSTs, and take a positive approach towards adopting SSTs in their hotels. This research also allows various government agencies such as the Singapore Tourism Board, the Economic Development Board, and the Infocomm Development of Singapore to render assistance and funds to the hotel industry.

Justification

An extensive review of the literature suggests that SSTs have the potential to increase, or at least maintain current service satisfaction. According to a study by Beatson et al., (2006) consumers who have a successful interaction with SSTs are more likely to stay loyal to the firm. They are also likely to have positive word of mouth, and repurchase

intentions (Bitner, Brown, & Meuter, 2000). In the hotel industry in Singapore, personal service delivery is still the dominant service delivery mode. With no leaders forging ahead with SSTs in the Singapore hotel servicescape, hoteliers are finding it difficult to justify the need for SSTs. Thus, with the growing research proposing the benefits of SSTs, hotels in Singapore need to have a better understanding of the applicability and effectiveness of using SSTs.

Constraints

A theoretical approach will be used to understand how SSTs are implemented in the hospitality industry, and to develop a framework for the hotel industry in Singapore. There will be no quantitative survey and research done for the purpose of this study. All research will be conducted through academic sources.

Part Two

Introduction

Due to the rising demands for faster and convenient services, firms have been introducing self service technologies for customers. Industries that have successfully embraced these technologies include the airline industry, and the banking industry. It is also becoming increasingly evident that technological advances and innovations will be the key component of customer and firm interactions (Meuter, et al., 2000). However, the hotel industry in Singapore has been reluctant to introduce new technologies to their customers in the last decade. In order to understand the issues behind the slow adaptation of SSTs in the hotel industry, an extensive literature review will be carried out. This literature review also evaluates the effectiveness of SSTs in the hotel servicescape.

In part two of the paper, the literature review will comprise four main sections. The first section determines the characteristics of the hotel industry and the existing issues and challenges faced by the hotel industry in Singapore will also be discussed. The second section will discuss how SST can improve customer satisfaction levels. This section will study traditional service delivery methods and perform a comparison between SSTs. The third section will examine the types of SSTs available for the hotel industry. This section will include a critique of the applicability and effectiveness of applying SSTs in the hotel industry in Singapore. The last section will examine the perspective of using SSTs from the viewpoint of the customers and the hotel.

Employment trends in the hotel industry in Singapore

The hotel industry is the central sector in the hospitality industry, and is rapidly becoming one of the fastest and largest growing industries in the world. The hotel industry, accounts for millions of jobs, and economic contributions to state and local governments (Pizam & Shani, 2009). According to a study by Lema (2009), the hospitality industry in the

United States will employ more than approximately 15 million workers by year 2014. In Singapore, the economy continued to grow, and has since created 82,000 jobs since the beginning of the year. The employment outlook in the services industry was also largely driven by the hotel industry, which accounted for approximately 52% of the job creations (Manpower Research and Statistics Department, 2010).

Labor intensive nature of the industry

The opening of new hotels which include Integrated Resorts, and the expansion of existing hotels has led to a continued demand for labor. This demand for labor is also fueled by the labor intensive nature of the hospitality industry. Extensive labor and capital injection is necessary for the survival of hotel businesses. In order to satisfy the ever-changing demands of hotel guests, hotels will typically employ many employees to work round the clock. It is also estimated that there is one employee for every hotel room present in the world (Choi, Woods, & Muarrmann, 2000). This labor intensive nature is also affirmed in a study by Pizam and Shani (2009), where hotel management employees attest to the strong significance of human capital for the success of hospitality companies.

Under-staffing and employee turnover

Due to the labor intensive nature, and the expanding numbers of hotels opening all over the world, the hospitality industry has faced problems with recruitment and retention. This has led to under-staffing issues which have been documented in many research papers (Baum, 2002; Choi, et al., 2000; Poulton, 2008; Watson, 2008). According to a publication by the Ministry of Manpower in Singapore (2010), the service industry which includes the hotel sector, accounted for three out of four of the overall job vacancies in June 2010.

Given these demographic trends, the under-staffing issue in the hospitality industry remains very real in Singapore. These understaffing issues can be attributed to the negative perceptions of the hospitality industry as a less than ideal working place. Some of these

perceptions include long working hours, low salary scales, lack of career opportunities, poor working conditions, low job security, low skills requirements, harassment and the repetitive work found in the hospitality industry (Pizam, 1999; Watson, 2008). In the future, the industry may face intensified recruitment challenges if these issues are not effectively tackled, and the overall image of the hospitality industry remains negative among prospective employees (Hughes & Rog, 2008).

In Singapore, the understaffing issue has been made worse by the macro-environment. The small city state has a declining birth rate, a low unemployment rate, an ageing workforce, and a growing services industry that contributes to employee shortages. A total fertility rate of 2.1 is required for the population in Singapore to sustain itself, but in 2009, this rate plummeted to 1.23. This is a major concern for the Singapore government as the threat of an ageing nation becomes very real (Huang, 2010). It has also been reported that between July and September 2010, the unemployment rate in Singapore fell to 2.1 %, the lowest since March 2008. This low unemployment rate and the rising number of hotel room inventory in Singapore is likely to create fierce competition for labor in the hotel industry (Cai, 2010; Tay, 2010).

Locals in Singapore also shun the hotel industry and this forces the hotel industry to become largely dependent on foreign labor. However the labor situation in the hotel industry has escalated, as the Ministry of Manpower recently announced the introduction of increased foreign workers' levy, and tightened conditions for hiring foreign workers in an attempt to curb Singapore's reliance of foreign workers, and to engage the industry to work more productively (Ramesh, 2010; Saad, 2010). Therefore, the government's policy of increasing the hike in hiring foreigners, and the labor shortage problems already faced in Singapore, adds to the seriousness of employee resourcing in Singapore.

The employee turnover situation is also worrying in the hotel industry in Singapore. Employee turnover is considered as a critical issue that needs to be effectively managed. Turnover of employees arises when employees leave the hotel operation and are replaced by new ones. These employees leave the hotel industry due to varying reasons such as poor selection practices, inadequate training, unrealistic expectations and inaccurate information about the job, stressful poor working conditions, low wages, and lack of incentives (Kim & Jogaratnam, 2010). In Singapore, the opening of the Integrated Resorts contributed to the high turnover rates experienced by many hotels and restaurants in Singapore. Many employees who have moved over to the resorts were motivated by the higher pay promised at the resorts (Huang, 2009).

The stress levels in the hospitality industry were also cited as an important determinant for high employee turnover. Lo and Lamm (2005) found that stress was an integral part of jobs in the hospitality industry, and it was expected that hospitality employees were not able to tolerate these occupational stress levels. Thus, many hospitality workers have expressed the lack of job satisfaction arising from the high stress levels as one of the main reason for leaving the industry (Chikwe, 2009).

Increased government pressure to improve productivity

In 2010, the Singapore government turned its focus on productivity to maintain competitiveness in the region, and to stimulate continuous economic growth. With Singapore growing as a tourism hub, it became crucial for the hotel sector to focus on raising their productivity level (Hussain, 2010). By 2015, Singapore is expected to provide an additional 100,000 jobs and 20 million dollars of tourist receipts. With this high growth potential, the Singapore government is eager to push for higher productivity levels in this labor intensive industry (Chin, 2006).

Measuring productivity in the hotel sector can be a challenging task. Productivity is usually defined as “the ratio of inputs to outputs (Jones & Siag, 2009, p.225). However, there is no general consensus on the definitions and measurements of productivity. The intangible nature of hospitality services leads to the difficulty to exactly define and measure the service inputs and outputs. The nature of services where simultaneous production and consumption takes place results in further complicated issues with perishability, heterogeneity, and differing service encounters (Jones & Siag, 2009).

Despite the difficulties in measuring productivity, researchers have suggested automating some of the services process, and involving customers in the service production to alleviate the productivity issue faced by many hotels (Brown & Dev, 2000). Hence, many hotels have now introduced automated self-service check-in kiosks, Internet booking websites, interactive touch screen panels to engage with their customers.

The evolution of service delivery

Over the last two decades, services has migrated from human interaction to the substitution of technology for service employees or, where possible, to electronic services that can be deployed anywhere at any time. This evolution of services is somewhat similar to the past experience in the agricultural and manufacturing industry where human labor has been relentlessly replaced by automation. SSTs started out as service transactions that did not add value, or bring addition revenue to firms. They were a mere substitution of labor. A fine example is the introduction of automated teller machines (ATM) by banks that saved labor costs, and allowed customers to perform banking services at their convenience (Fitzsimmons, 2003).

Slowly, other industries started introducing technology to improve efficiency, costs, and quality of the service. The most distinguishing and widely used information technology employed at hotels is the hotel information system. The hotel information system otherwise

referred to as the property management system include applications for the front and back office, restaurant and banquet operations. This technology provided service employees with vital information about their customers to enable a better, personalized service delivery (Ham, Kim, & Jeong, 2005).

Subsequently, firms started introducing part of the service delivery process to customers. This allowed firms to enjoy cost savings, and to improve their speed and availability of delivery (Messinger, Li, Stoulia, Galletta, Ge, & Choi 2009). Hotels traditionally distributed their room inventory through intermediaries such as travel agents, and tour operators. However, the rise of the Internet created fundamental changes to the way hotels conduct their businesses. The Internet allowed automated self service in the form of online bookings to take place (Kang, Brewer, & Baloglu, 2007).

Today, there are more advanced service delivery processes and electronic information deployed to allow customers to navigate on their own. Self service kiosks for example, are now showing up in hotels and can perform multiple functions that range from checking in a guest, booking a reservation, to dispensing information (Kasavana, 2008).

Customer satisfaction from services

Research has shown that personal interactions between service employees and customers are crucial for customer satisfaction and commitment. However, the introduction of SST facilities, reduces the need for human interactions, and forces customers to deliver the service themselves with the aid of technology. Thus this leads to concern that SSTs will impact the service encounter especially in terms of service quality, satisfaction and loyalty, which might cause detrimental effects on the firm's success and survival (Ganesh, Arnold, & Reynolds, 2000).

The customer perception of the quality of service can be measured by a multiple item instrument known as the SERVQUAL. Parasuraman, Zeithaml, and Berry (1988) developed

this 22 item instrument measuring scale which categorized five dimensions of service quality found in interpersonal service interaction. The five distinct dimensions represent tangibles, reliability, responsiveness, assurance, and empathy found in the delivery of the service. SERVQUAL has a wide potential of applications, and has been adapted by a various industries. This generic instrument allows firms to determine and pinpoint areas which require attention and action to improve service quality. However, although the SERVQUAL model provided a good prediction for overall service, it is often regarded as a context of an overall service experience (Makarem, Mudambi, & Podoshen, 2007). Many researchers have also pointed to the problematic dimensional structure of the SERVQUAL model. It is possible that the dimensions found in the model may vary from industry to industry given the nature of service quality construct. Nevertheless, SERVQUAL remains widely used because it provided a simple tool for firms to measure service quality.

On the other hand, there is burgeoning interest in the area of customer. Besides maintaining high quality standards, many hospitality firms recognize the need to enhance customer satisfaction for their firm's survival. It is believed that satisfied customers are more likely to establish loyalty with the firm, display repeat purchasing, and positive word-of-mouth behavior (Sim, Mak, & Jones, 2006). For hotels, customer satisfaction can derive from many elements such as cleanliness, room rate, service quality, reputation, convenience, and the location (Choi & Chu, 2001). With the introduction of SSTs, it became imperative that researchers examine the possible satisfaction drivers that can derive from this technology.

Dobholkar (1996) proposed an alternative model for service quality for technology based self-service options. He argued that previous service quality research relied on consumer perceptions which were unrealistic for technology based applications as consumers were unable to fully experience all aspects of the service dimensions. Thus, an attribute-based model which centered on customer participation and SST attributes was recommended. The

model relied on a compensatory process to evaluate attributes associated with SSTs to form expectations of service quality. The attributes include the expected speed of delivery, use, reliability, enjoyment, and control. With these expectations of service quality, the intentions to use the technology also appear more apparent (Yen, 2005).

Meuter et al., (2000) on the other hand, conducted a study which revealed incidents that gathered high satisfaction levels. The majority of participants who experience a satisfying SST encounter attributed it to the improvements and additional benefits that result from using the technology. The benefits the consumers enjoyed include an ease to use the technology, the ability to avoid service employees, time and cost savings, and the control that SSTs allowed. Other reasons that resulted in the satisfying incident included the capability of SSTs to immediately solve problems, and how SSTs lived up to the customers' expectations.

In another study by Beatson, Coote, & Rudd (2006), SST attributes and personal service was found to have contributed to overall satisfaction. Customers perceive a learning curve associated with the technology when using SSTs and a successful encounter with the technology is crucial for retaining them. The authors also recommend easy instructions for the use of the SSTs and adequate customer and employee training to ease the customers to switch to SSTs.

In summary, for customers using traditional service delivery methods, customer satisfaction was mainly derived through the service employee's responsiveness, reliability, and the immediate service recovery practices. The service employee was the crux to delivering services that could garner customer satisfaction. When traditional services shifted towards SSTs, researchers discovered that SSTs could also perform satisfying outcomes without any human interaction. Customer satisfaction is related to the customers' expectation of services, and customers will judge the service outcome in relation to their expectations to derive their level of satisfaction. Thus for SSTs service encounters, customers were able to be

satisfied as the technologies provided a convenience, reliable, consistent service delivery, whereby service outcomes were predictable (Makarem et al., 2009).

The popularity of self service technology

The rise of information technologies have greatly transformed how business processes work. The hotel industry has been confronted with technological advances which have resulted in the transformation of traditional service delivery practices. Customers who were once frustrated with incompetent and inexperienced service employees, long waiting queues, closure of businesses at the time the customer prefers are now turning towards SSTs (Kasavana, 2008). With the wide popularity and acceptance of SSTs in the marketplace, more hotels are now eager to leverage on SSTs to improve service standards, operational efficiencies, and improve customer service. It is believed that the drastic progression from interpersonal service encounters to SSTs is crucial for the hospitality and service industry to continue thriving (Cunningham, Young, & Gerlach, 2009)

Types of SSTs

There are a wide range of SSTs available, but the existing research on SSTs is primarily focused on the satisfaction that customers derived from using SSTs. Many of these studies also typically focused on a single SST and the customer attitudes, and readiness towards these SSTs. Few studies were conducted to examine the range of SSTs available to consumers and the hotel industry. Meuter, et al., (2000) presented a conceptualization of SSTs options available and discussed the types of technology interfaces and the purpose of these technologies. The authors classified SSTs into four different technology interfaces. The four interfaces include telephone-based technologies and interactive voice response systems, Internet based interfaces, interactive kiosks, and video technologies. These technologies were implemented mainly for customer service, carrying out transactions, and to allow the

customers to perform self help. This emphasis on the technological interfaces and purpose captured the essence of the nature of SSTs perfectly.

The use of SSTs to provide customer service, transactions and self help functions allows companies to develop more sophisticated machines that can effectively serve multiple functions. This advancement of technology gives firms the flexibility of choosing the type of interface and the functions the machine can perform. However, this flexibility can be challenging for a firm deciding on the type of SST device that is to be implemented. In order to successfully implement SSTs in the hospitality industry, hospitality firms must implement devices that customers that have clear and easy instructions, and have direct benefits for the customers (Kasavana, 2008).

Self-service kiosks.

Self-service kiosks are one of the most popular applications introduced in the hotel servicescape. As customers grew accustomed to the convenience offered by SSTs, the perception of SSTs being an inferior service changed. In 1997, Hilton rolled out its first self-service kiosk. However, guest usage during this introduction period was dismal. There were many issues faced by customers when they attempted to use the technology. The self-service kiosks were not placed in prominent locations, and customers became frustrated when the kiosks could not deliver simple services such as finding a reservation, and had to return to the waiting line after trying to use the kiosk. Customers and employees were also adverse to using technology at that time (Griffy-Brown, Chun, & Machen, 2008).

Nevertheless, ten years after the self-service kiosks first foray, the hotel industry is gearing itself to introduce more kiosks for its guests. Technological advances and previous self-service kiosks failures have provided valuable learning lessons for hotels. Previously, these self-service kiosks have failed because hotels had unrealistic expectations, incorrect utilization, and positioning that led to kiosks that could not generate positive experiences.

However, thanks to the popularity of airline self serve check in kiosks, customers have now become familiar with the SST concept and this allowed hoteliers to tap into the technology to introduce more self-service kiosks (Mayock, 2010; Ostrowski, 2010).

Technology advances has also made it possible for hoteliers to include multiple functions for self service kiosks. Many hotels are implementing these self-service kiosks to complement the existing services provided. Two common services which are widely accepted in hotel kiosks include the checking-in and checking-out applications. To encourage guest usage, hotels such as the Hilton group provide kiosks that have the ability to print restaurant coupons. Other hotel kiosks on the other hand, allow customers to print their airline boarding passes while checking out (Ostrowski, 2010; Shaw, 2004). The opportunities that these machines can offer are endless, and it all depends on the hotel purpose of implementing these machines.

Another interactive kiosk which is growing in popularity is the Microsoft Surface. The Microsoft Surface is a horizontally placed multi touch computer that allows multiple users to simultaneously interact with data and each other with the touch of simple hand gestures and touches. For users, the device promises a fun and interactive experience. For businesses, the Microsoft Surface provides remarkable potential for firms to deliver information and services to their customers (Microsoft, 2010). Sheraton Hotels and Resorts have introduced this computer display set into a tabletop as an interactive kiosks which allows guests to use the technology simultaneously. Some of these applications found in the Microsoft Surface include the CityTips, an electronic concierge which allows guest to search for maps via satellite images, and the Sounds of Sheraton, which offers a compilation of popular music (Watkins, 2009).

A study by Lui and Picolli (2010) revealed that the success of self service kiosks depended largely on the acceptance of the technology and the realistic timeframe given for

the SST investment to realize. Customers will usually take time to adapt to the new technologies, and will only use the technology if it is beneficial to them. Hotels should also not expect an immediate willingness for customers' to switch or try these technologies. As such, it is recommended that hotels offer a multitude of service delivery channels to allow customers to choose their preferred choice.

Internet based self-services

The Internet provides a wide array of self-service possibilities. Customers were now able to interact directly with firms to search for information, submit queries, and communicate with service employees through emails, and forums. This also gives business suppliers an opportunity where products can be sold to customers without any time or geographical constraints. Hotels for example, can utilize the Internet to effectively perform marketing and customization to meet the needs of their customers (Jeong, Lambert, & Lambert, 2001).

In a study by Law and Hsu (2005), the authors investigated the importance of the dimensions of attributes of hotel web sites from the web site user perspective. Their research revealed that web site users were most concerned about finding reservation information and facilities information when visiting a hotel website. This was because there was no human interaction on the Internet, and web site users were determining their customer satisfaction levels, and purchasing decisions solely on the contents put on the web site. As such, the success of Internet based self service largely depends on the quality and quantity of information which will allow customers to use the technology with more ease (Kasavana, 2008).

Despite the growing number of Internet users, the assumption that all users are ready and equipped with the skills to cope with Internet innovation is erroneous. Many customers turn to this technology based service encounter because they perceive this service delivery as

convenient, enjoyable, and easy to use (Meuter, et al., 2000; Yen, 2005). However, it appears that other groups of consumers are frustrated by such technology interactions.

As such, it is important that hotels consider both individual and global attitudes towards the Internet delivery system. This analysis will allow hotels to understand the customers' attitudes and intention to use the Internet for service delivery, and to develop an effective strategy that will increase Internet based SST usage. After all, online self service technologies have the greatest positive return on investment, and hotels should tap on this important channel to foster customer relationship management (Kasavana, 2008).

Mobile-commerce

The mobile landscape is quickly emerging to be an important channel for firms to market their goods. The growing popularity of mobile technology, which includes the advancement in mobile interfaces, and the growth of 3G networks, have greatly increased the number of mobile device users worldwide. The rising numbers of mobile device users contribute to the growth of mobile-commerce (m-commerce). In terms of the business potential, m-commerce differs from e-commerce as it allows real time information to be viewed at the fingertips of the customer, giving consumers the absolute control and access to information (Kim, Park, & Morrison, 2008; Schetzina, 2010).

Smartphones are now forecasted to grow from 161.4 million units in 2009 to 415.9 million units by 2014. The popularity for Apple's iPhones in the consumer market, Blackberry devices, and the introduction Goggle's Android phones have sparked a demand, and increase the choices available in the smartphone market. The number of applications available for consumer use has grown exponentially, with a plethora of applications available across all types of mobile devices. This current paradigm shift enables consumers and business users to become more mobile. Smartphones have grown to become the preferred

device for voice, data, and video capabilities among consumers (Kumar, 2010; Nessler, 2010).

With this increasing adoption of smartphones by consumers, the hotel industry has grown to recognize the importance of m-commerce as a fundamental part of many customers' travel experiences. More hotels are now utilizing the mobile environment to deliver services. Some hotels offer check in conveniences, mobile marketing, and location based promotions. Hilton Worldwide for example, released an application for its luxury Waldorf Astoria brand in November 2009. This application allowed guests to check in to the hotel before the guest physically arrives at the hotel, check out of the hotel, redeem hotel stay points, and to even book a reservation at the restaurant or order from a menu (Serlen, 2010). Other hotels have introduced Apple's iPad mobile devices rentals to enable guests who do not have smartphones to enjoy the same services that smartphone users take pleasure in (Lombardi, 2010).

SSTs from the firm's perspective

The use of technologically facilitated service deliveries is extremely promising for the firm, customers and employees. From the firm's viewpoint, implementing SSTs can be an expensive investment. However, SSTs allow firms to take advantage of the virtues of both technology and personal service. Thus, firms can correspond more quickly to customer enquiries and problems, provide faster service which are precise and personalized (Berry, 1999). According to Walker, Craig-Lees, Hecker, and Francis (2002), SSTs can also improve internal efficiency and raise productivity to reduce rising labor costs, and to gain competitive advantages. Beatson, Lee, and Coote (2007) have also echoed this view by suggesting firms to adopt SSTs to build technological reputations for differentiation.

SSTs also have the ability to address some problems that were associated with the human touch in service delivery, heterogeneity, and perishability. Some of these problems

were as a result of the mood and personality of the service employee. This results in service experiences and encounters that varies and are unpredictable. SSTs on the other hand, create a more consistent service experience, and the customer will be able to know precisely what to expect with every service encounter with the SST, and enjoy the same experience each time. Service providers also face many staffing issues due to the varying demand of customers. The introduction of SSTs allows service providers to handle varying demand without having to continually increase staffing levels. Besides, SSTs now have the potential to extend the service timings, to reach out to more customers, and to suit the time preferences of the customers (Beatson et al., 2007; Curran, Meuter, & Surprenant, 2003).

Branding has become an indispensable strategy for hotels, and the potential impact SSTs can bring to the brand is a crucially important issue. Many hotels rely on their brand equity to generate management contracts, franchises and businesses. The lower costs of acquiring systems at hotels are now being diminished by the Internet and technological advances. This allows independent and smaller hotels to compete effectively with chain hotels. As such, more hotels are turning to SSTs as a proposition to add value to their brand name, and to consistently deliver a unique customer experience that continues to strengthen and maintain the brand (Clay, 2006).

Although there are many potential benefits that SSTs can bring to the firm, there are also some concerns. The lack of human to human interaction can result in the possibility of a service failure with inadequate or slow service recovery strategies, and service failures which are not evident at the moment of the service delivery (Girman, Keusch, & Kmec, 2009). Many researchers have addressed the importance of establishing service recovery programs as a key tool to satisfy and maintain loyal customers. A successful service recovery can bring desirable outcomes such as increased customer loyalty; repurchase intentions, and positive word of mouth behavior. A lack of service recovery strategies will result with customers

switching to the firm's competitors, and negative word of mouth behavior which can hurt a firm's reputation (Holloway & Beatty, 2003; Sousa & Voss, 2006).

Many hotels are still in the infancy of SST deployments. Many hotels are trying to observe and learn from the airline industry, and with the lack of baseline information on hotels using SSTs, the investment can be rather risky. At the moment, there is still limited information on how many potential customers that could have been driven away due to the poor deployment of SSTs (Clay, 2006).

In addition, the potential lack of human interaction may prevent firms from developing strong bonds with their customer. This can result in a loss of up-selling opportunities, and reduce the profit margins of the firm. Lastly, firms are concerned about how their employees will react when SSTs are introduced in their workplace. Firms fear that employees will resent the technology as it threatens their job security (Curran et al., 2003).

SSTs from the customer's perspective

From the customer's perspective, the rapid proliferation of SSTs offers a number of advantages and disadvantages. Most customers are happy to serve themselves with the help of SSTs when they see an added advantage to using this technology. Some of the potential benefits of using SSTs include time savings from the reduced waiting times, cost savings, and a greater control over the service delivery (Curran et al., 2003). SSTs enable customers to perform and provide their own services without direct assistance from employees, and this allows customers to enjoy efficient, customized services (Meuter et al., 2000). The popularity of SSTs can also be attributed to the satisfaction that SSTs can offer.

Technology readiness affects how customers will use and embrace SST service options. It examines the positive and mental feelings that consumers can exhibit when interacting with technology based services. The technology readiness of customers can be affected by how firms promote and introduce SSTs. Thus, most customers prefer SSTs that

have easy interfaces, guidance and assistance from the firm to ease their transition from traditional services to SSTs (Lin & Hsieh, 2006).

The introduction of SSTs can exclude customers who do not wish to be involved in the service delivery process. Customer who do not see a perceive need, or any benefits from the use of SSTs may also opt out from this new technology (Curran & Meuter, 2005). At the same time, the existence of a technology based service delivery can cause anxiety for some customers, resulting in frustration when confronting an SST. When a service failure occurs during the use of SSTs, customers will often feel angry and helpless. The lack of physical contact with a service employee impedes service recovery processes, which can result in a dissatisfying service encounter, and the customer losing confidence in SSTs (Gelbrich, 2009).

Conclusion

The review of literature revealed a number of challenges faced by the hotel industry in Singapore. These challenges range from the labor intensive nature of the industry, to the understaffing issues and high employee turnover rates, to the increased pressure from the Singapore government to increase productivity in the industry. The macro environment of Singapore further escalates some of the staffing issues faced by hotels, and researchers have recommended using SSTs to alleviate the current situation.

Studies have also shown that SSTs have the potential to maintain, or if not increase the level of customer satisfaction. It was a concern that SSTs were not able to provide a service that was satisfactory for hotel guests. However, the review of literature revealed that SSTs have the potential to bring benefits to both the hotel and the customers. More importantly, SSTs promised to address some issues associated with the human touch in terms of service delivery, heterogeneity, and perishability. This allowed hotels to consistently deliver a service that is reliable for their customers.

The advancement of technology presents many exciting SSTs for hotels to choose from. Hotels should take advantage of these SSTs, and the growing technological readiness of the people to introduce new applications, and services that can continue to wow their guests. Torres and Kline (2006) have suggested hotels to move away from satisfying to delighting guests to obtain loyal customers and profitable operations. This will require hotels to deliver services that can exceed current customer expectations, and with the types of SSTs available, hotels can easily make use of these technologies to delight their guests.

Part Three

Introduction

With more hotels slated to open in the next two years, room inventory in Singapore is set to increase. Hotels in Singapore are finding it challenging to employ service employees to match the increases in room inventory. This problem is further amplified by the labor intensive nature of the business, negative perceptions of the working environment in hotels, stricter laws and policies on hiring foreign labor, and the macro-environment of Singapore. The Singapore government has also recently singled out the hotel industry as a key sector that needs to increase workforce productivity. Given the need for hotels to have high staffing levels to maintain their service standards, and the need for improved productivity, hotels must now turn to technology to alleviate some of these prevailing issues.

Over the years, the delivery of services has shifted from human interaction to technology and electronic services. Services were once commonly performed by service employees are slowly being replaced by self service technologies (SSTs). SSTs popularity is enhanced when a multitude of industries such as banking, and airline industries introduced these services aggressively in their servicescape (Beatson, et al., 2006). Consumers are also becoming more sophisticated and comfortable with technology interactions. For hotels, SSTs present an opportunity for them to deliver more services and options to their customers (Lema, 2009). It is believed that with increased consumer technology readiness, higher service quality can be achieved when using such SSTs. This higher service quality also directly affects the satisfaction derived from using the SST, and can influence positive word of mouth behavior, as well as favorable repeat behavioral intentions (Lin & Hsieh, 2006).

With the growing acceptance of SSTs, and the unfavorable labor situation in Singapore, hotels in Singapore should take this opportunity to introduce more SSTs into the servicescape. The introduction of SSTs can offer hotels and their customers a great deal of

benefits. However, in order to successfully implement SSTs at the property level, many considerations must be taken. Thus, this paper proposes a framework that will take into consideration the issues that hoteliers are concerned with, and to effectively implement these technologies. Further recommendations will be also discussed at the end of the paper.

Methodology

The literature review in the previous section revealed factors that led to high customer satisfaction in traditional and SST service encounters, issues with SSTs, the importance of customer technology readiness, and the types of SSTs available in today's market. Therefore, a proposed framework for adopting SST, presented in Figure 1 was conceptualized to draw on the discussion in the literature review. The proposed model seeks to provide a holistic depiction of the various steps involved in accessing a hotel's need for SSTs, and reviews the action plan hotels can adopt to introduce SSTs.

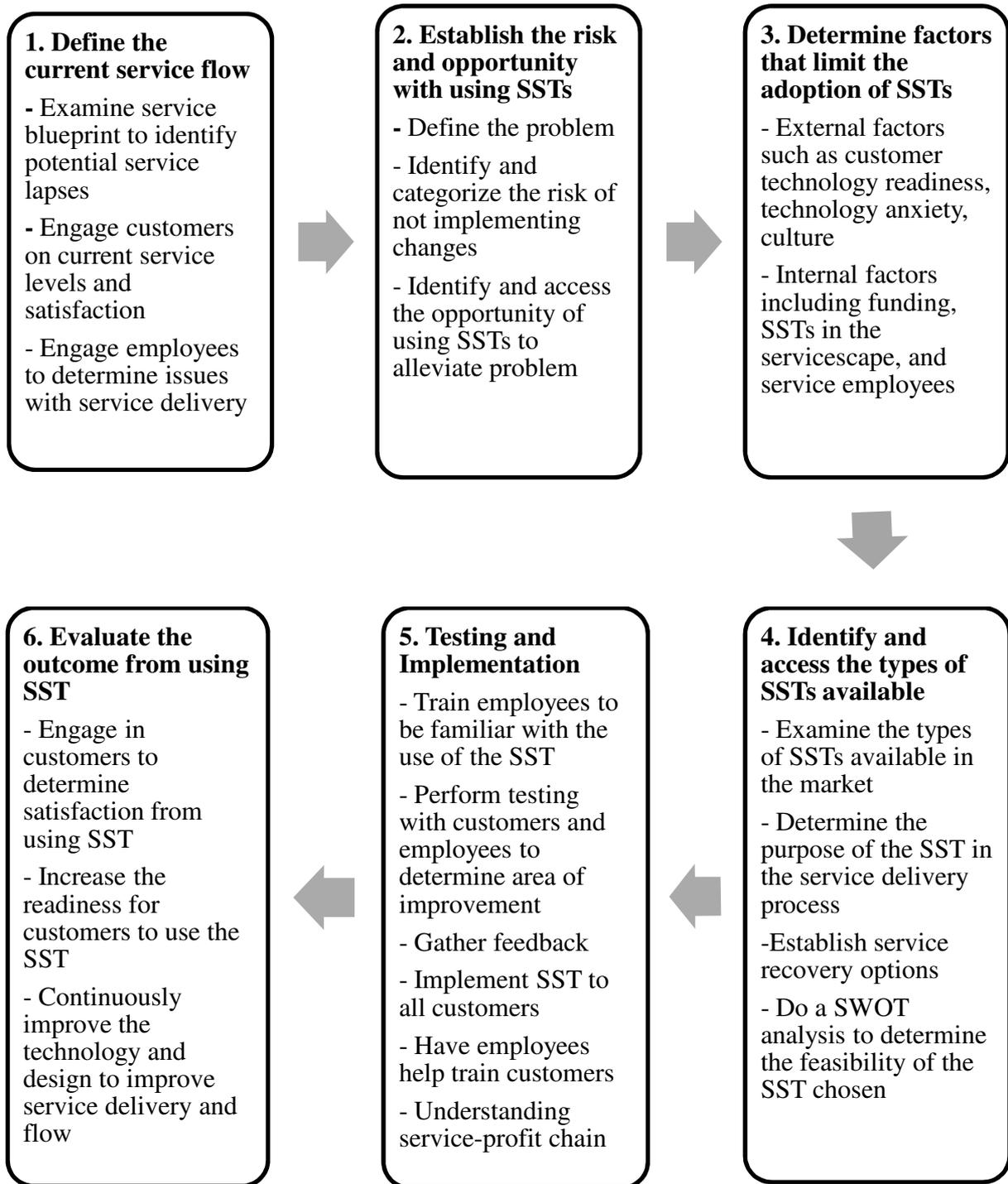


Figure 1. Proposed Conceptual framework for adopting SSTs in hotels

The proposed framework model for adopting SSTs in hotels

In the hotel industry, technology plays an important role. The success of the technology not only depends on the technical aspect, but also the way customers will accept and interact with the technology (Singh, Kim, & Huh, 2006). Many hoteliers have also realized the need to adopt new approaches that will continuously enable improvements to be made to the property's systems, procedures, employees and customers (Kandampully, Mok, & Sparks, 2001). Technology has provided opportunities for companies to deliver existing services in a more accessible, convenient, and productive manner. Thus, the proposed framework model consists of six phases to allow hoteliers to systematically implement SST in the servicescape. The first three phases allow hoteliers to assess the hotel's need for SSTs. The steps involve include the evaluation of current service flow, the risks and opportunities for implementing SSTs, and the determinant factors that might prevent the introduction of SSTs. This thorough assessment is necessary to allow hoteliers to evaluate service gaps, and to determine if SSTs can be the solution to such customer service concerns.

By going through the assessment in the first three phases, the hotel will have a better understanding as to using SSTs to meet the needs and requirements of both the customers and the hotel. This signals the hotel to conduct research on the types of SSTs available for the hotel industry; and to examine the SSTs that can best suit the needs of their customers. This phase is crucial, as the hotel needs to map its design for the SSTs, and determine the purpose of the SSTs in the service delivery process.

Subsequently, before the SST is fully rolled out at the property, it is essential that testing is conducted. Based on the trial results from the customers' feedback, the hotel will be able to fine tune their service design, and make improvements to the existing system. At this phase, it is also vital that the hotel informs and trains its employees and guests on the use of the technology. This will allow customers and employees to be confident of using the

technology when the SST is introduced throughout the property. Feedback must be continuously collected and monitored after implementation to ensure customer satisfaction levels and service standards remain consistent.

Assessing the feasibility of adopting SSTs

Phase One

From a customer perspective, it is typical that the service element effectively increases the value of the hotel's product and service offering. Studies from Berry, Parasuraman, and Zeithaml (1994) have shown that customers have often considered service reliability as the core attribute of good service. Excellent customer service is also vital in creating brand identity and the determinant of the success of the company. Hotels sell an intangible product which requires customers to pay before the service is delivered. This service is later produced and consumed simultaneously when the customer arrives at the hotel. As such, hotels face the challenge of producing services that are consistent, and in line with their service guarantee (Zeithaml, Bitner, & Gremler, 2009). Hogeve and Gremler (2009) have defined service guarantee as "an explicit promise made by the service provider to (a) deliver a certain level of service to satisfy the customer and (b) to remunerate the customer if the service is not sufficiently delivered (p. 325)." Due to the unique intangible characteristics of services, higher perceived risk is perceived during the purchase decision. Thus, service guarantees become strategies that are developed by hotels or service businesses to reduce the customer perception of risk. They also serve as extrinsic cues that signal service quality and to enhance customer satisfaction, increase service employees' drive to deliver quality service (Hays & Hills, 2001).

In order to successfully deliver the service guarantees, many hotels also have service blueprints in place. A service blueprint portrays how the service system is carried out, and it provides a way to break down the components of the service to enable service employees

with the means to execute the tasks (Ziethmal, et al., 2009). Because the service guarantee and service blueprint are intrinsically linked, hotels will be able to determine potential service lapses, service failure points that can affect the service guarantee. These stages are depicted in figure 1. Customer feedback can be gathered through customer satisfaction surveys. This information will allow hotels to identify services that do not meet the customer expectations and decide on solutions that can close these gaps (Kandampully et al., 2001).

Phase Two

In phase one, the potential service lapses and gaps are identified. This allows the hotel to clearly define the problem in the service delivery process, and to come up with solutions that can reduce these discrepancies to maintain its competitive advantage (Min & Min, 2005). The hotel can consider the use of SSTs to help close these service gaps and lapses. However, before doing so, the hotel will need to establish the risk and opportunity of using SSTs to solve the problem defined. As shown in figure 1, this is done through the identification and categorization of the risk involved in not implementing any changes to the existing problem. If this risk assessment proves to undermine the service quality standards and service guarantee at the hotel, the hotel should consider the use of SSTs to alleviate the problem. Research must subsequently be carried out to determine the feasibility of using the SST and the potential benefits these SSTs can assist in the service delivery process.

Phase Three

With the risk and opportunity assessment done for the adoption of SSTs, the hotel should now look into factors that might limit the introduction of the SSTs. This is crucial as there may be other reasons that can hinder or cause the SSTs to fail. The factors can be separated into external and internal factors as illustrated in figure 1. The external factors scrutinize the macro-environment, and determine if there are compelling issues that limit the

SST adoption. Internal factors on the other hand, examine factors such as the hotel's servicescape, its employees and the financial situation of the hotel.

One important external factor that could seriously impede the implementation of SST is customer technology readiness. According to Parasuraman (2000), technology readiness refers to "people's propensity to embrace and use new technology for accomplishing goals in home life and at work" (p.308). SSTs are new technological options that provide flexibility and convenience to customers. However, some customers can become uncomfortable, or exhibit a certain degree of technophobia when using such technology (Meuter, Ostrom, Bitner, & Roundtree, 2003). Therefore, hotels need to understand customer readiness to use SST service options.

A study by Lin and Hsieh (2006) revealed customer technology readiness can result in higher perceived service quality and positive behavioural intentions when using SSTs. Customers who have more positive attitudes towards new technology service options, the ability to use the new technology, are more likely to develop higher willingness to embrace SSTs, which in turn enhances customer satisfaction. Hence, it is important hotels pay particular attention to customer technology readiness to improve favorable outcomes of SSTs execution.

With the growth of global businesses, and the expansion of the middle class in Asia, the predominantly homogeneous group of western travelers is now giving way to a more culturally diverse group of travelers. However, there is a current lack of literature on the effect of culture on SST within the service encounter. Fisher and Beatson (2002) have outlined some cultural theories, and applied them to SST dimensions to propose some cultural behaviors that may be displayed. The researchers believed that customers from low power distance cultures are more willing to accept SSTs than those from high power distance cultures. Power distance as described in Hofstede's typology of cultures refers "to the extent

to which status differences are expected and accepted within a culture” (as cited in Mattila, 2000, p. 265). High power distance cultures are typically characterized in Asian cultures, while the cultures of many Western countries are associated with lower power distance characteristics.

As such, hotels need to be aware of such cultural differences between their customers before deciding on the SST implementation. Cultural differences among customers can result in different SST acceptance behaviors, and this can ultimately affect the hotels’ effective implementation of SST delivery solution.

On the other hand, internal factors that require examination include the placement of SSTs in the servicescape of the hotel, service employees, and the financial ability of the hotel to fund the introduction of SSTs. A study conducted by Griffy-Brown, Chun, and Machen (2008) revealed that self service kiosks which were originally introduced by the Hilton Hotel Corporation failed due to the poor location of the kiosks, as well as an unreliable technology of the kiosks in the 1990s. As hotel lobbies are meant to be warm and welcoming, the placement of technology in these lobbies did not fit into the original design of the hotel lobbies. However, with the advancement of technology, self service applications now come in many design options, and within customer own technology such as mobile phones. This gives hoteliers a wider range of self service options and integration with customer personal portable devices (Lee, 2010).

With the implementation of SSTs, hotels must also consider the role service employees will play. Curan, Meuter, and Surprenant (2003) revealed that customers’ favorable attitude towards service employees may actually influence SST usage. Thus, this suggests that customers, who are satisfied with the current means and level of service delivery, may be reluctant to switch to SSTs. At the same time, the hotel must be aware of the negative feelings that may arise from its service employees due to the implementation of

SSTs. SSTs alter the traditional service delivery process and reduce the need for interpersonal interaction. Without proper training and role definition of service employees in the servicescape, this can result in service sabotage (Harris & Ogbonna, 2002).

The last internal factor that must be considered is the hotel's ability to fund the implementation of the SST. The adoption of any new technology is a costly investment. Thus, without proper funding and research carried out, the hotel will not be able to roll out SST options at the hotel. Therefore, proper allocation of the budget must be planned in ahead for the introduction of this technology.

By performing the three phases, hotel management will have a better picture on the feasibility of adopting SST. The purpose of this framework allows hotel managers to have a better understanding from the customer perspective of the service delivery process. If there are more risks and factors that limit the adoption of the SST, the hotel should delay the implementation of the SST, and search for other alternatives to counter their existing issues. On the other hand, if the research in the first three phrases has proven SSTs' ability to alleviate current service issues, the hotel may now continue to the next three phrases for implementing the SSTs.

Adopting the SSTs

Phase Four

According to figure 1, market research should be conducted to examine the types of SSTs available in the market. Hotel management will need to determine the purpose and type of interface for the SST. The purpose of the SST is crucial to the success of the SST as it determines how the SST will be used by the hotel customer. More importantly the SST must address the potential service lapse or gaps identified in phase one. By creating SST that addresses the customer needs, it intensifies the need for the customer to use the technology. Customers will also be satisfied with SSTs when the technology is user friendly, able to solve

an intensified need, convenient, time saving, money saving, and is able to perform what it is designed for (Meuter, et al., 2000). Hence, these are the important factors hotels have to look out for when determining the functions of the SSTs and the type of interface.

In addition to assessing overall satisfaction, it is also important hotel managers identify the key drivers of the satisfaction assessment to ascertain the relative importance of the varying components of the service (Beatson, et al., 2006). This allows management to understand the causes of dissatisfying SST experiences to prevent such incidences from happening. Technology failure has been cited in many studies as one of the most common SST failures. Technology failure causes a breakdown during the service delivery process. This failure in the use of SST not only causes dissatisfaction; it also triggers negative emotions of anger and helplessness (Beatson, et al., 2006; Forbes, 2006; Gelbrich, 2008). Therefore, hotel management has to ensure that proper service recovery processes are in place before the implementation of the SSTs.

Service recovery refers to the actions a company takes in response to service failures and mistakes. Research has shown that an attempt to deal with service delivery issues can positively influence customer satisfaction, word-of-mouth behaviour and increase customer loyalty with the company. A study by Mattila, Cho, and Ro (2009) revealed that SST failures are a result of outcome failures, and the service recovery strategies can range from compensation, technology based recovery options to interpersonal interactions. Currently, most companies do not have any service recovery strategies, and this often results in customers switching to another company (Forbes, 2008).

SWOT analysis can be carried out to agree on the type of SST chosen. The SWOT analysis is a situational analysis of strengths, weaknesses, opportunities and threats to the hotel. The purpose of this analysis will identify which SST will fit the hotel's resources, and the demands of the hotel environment. It will allow the hotel to build on its strengths, and

exploit the opportunities available, and to be aware of the threats, and to overcome the weaknesses of the technology in order to develop a competitive advantage against other competing hotels (Shoemaker, Lewis, & Yesawich, 2007).

Phase Five

Before the hotel implements the SST, the service employees of the hotel must be equipped with the skills to cope with the changing levels of technology in order to apply the relevant information in their own work area. Referring to figure 1, the hotel must motivate and prepare its service employees to adapt to the new SST. The hotel must assure the employees that the technology is not introduced as a cost-saving measure or as a means to reduce manpower, so as to reduce employee resistance over the adoption of SST. This will allow service employees to interact and assist their customers to use the technology.

Once the service employees have been trained, the hotel should undergo a trial period for the testing of the technology. A trial test allows the hotel to determine if there are any lapses in the service delivery with the SST, and to make adequate improvements before the actual launch of the technology. It is important that the hotel gathers information from their employees and the customers about the design of the SST, or risk failure upon implementation (Curran & Meuter, 2005).

The profitability, customer loyalty, employee satisfaction, loyalty, and productivity in the hotel are all intrinsically linked. This relationship is otherwise known as the service-profit chain. SSTs can only be successfully implemented if hoteliers pay attention to the factors that help drive profit, and this includes treating employees and customers with the highest regard. The hotel has to recognize that the profit and growth of the business is stimulated largely by customer loyalty. This customer loyalty is affected by the customer satisfaction derived by the value of services offered to the customers. However, this value can only be created when there are loyal, satisfied and productive employees. Training is essential for employees, and

this creates empowered employees. Empowered employees are able to deliver higher quality services, assist and guide customers, to allow customers to fully benefit from the SSTs, and the higher standards of service. Therefore, if the customers are satisfied with the SSTs, they are likely to become loyal customers, and this will result in repeat businesses, and referrals which will improve the profitability of the hotel, and increase the revenue growth (Heskett, Jones, Loveman, Sasser Jr., & Schlesinger, 1994).

Once the hotel has addressed the prevailing issues in the trial stage, the SST can be implemented general public. The hotel will continue to deploy service employees to help customers overcome their initial uncertainties about the technology. Thus, this increases the customers' acceptance to the SSTs (Walker, Craig-Lees, Hecker, & Francis, 2002).

Phase Six

Once the hotel has implemented the SST, the hotel has to continuously monitor the use of the SSTs. The hotel needs to engage customers to determine the willingness of the guests to use the SSTs. If the adoption rate for the SST is low, the hotel has to consider the factors hindering the use of the technology, and implement changes to the technology. However, if the feedback from the use of the SST is good, the hotel will still need to continue monitoring the use of the SST, and render assistance to customers who are unfamiliar with the technology.

Besides monitoring the usage of the SST, the hotel should encourage customers to repeatedly use the technology. Hotels can promote better knowledge and attitudes of the SSTs to lower the reluctance to use the technology. Simple instructions should always be near the technology and employees should also be around to assist customers new to the technology. In order to increase SST usage, hotel management should stress the unique features and advantage of the technology to drive favorable customer attitudes towards the SST. The hotel can also motivate customers to use the SST by offering some incentive, such

as discount coupons to increase usage. In addition, it is crucial the hotel continues to monitor, maintain and upgrade the existing SST to increase the level of customer satisfaction, and the popularity of SSTs as shown in figure 1 (Curran, et al., 2003).

Recommendations for future research

The exploration of customer use of SSTs in the hotel servicescape is a relatively new area of research, and provides future research opportunities. The conceptual framework proposed in this paper, provides a step by step guide for hotels to implement SSTs. However, there are limitations to the model as it has not been tested and is only based on the theoretical findings in the current literature. As customers play a very vital role in the success of the SST, it is crucial to study the readiness of Singapore hotel guests. Some aspects hotels can look into include the technology readiness, and the culture of the hotel guests.

More research can also be done to examine the SST service quality dimensions that will improve customer satisfaction. At this moment, hotels focus at SSTs can help improve current customer satisfaction levels. The paper recommends the use of self service kiosks as the multiple functions available on these interactive kiosks will allow the hotel to alleviate its under-staffing issues especially during peak hours and seasons. However, as the hotel industry is largely dependent on interpersonal interactions it is unclear if customers will fully accept the use of SSTs especially in the premium hotel sector.

Additional research should be carried out to examine the possible implications that can arise from SST failures. Although the framework recommends hoteliers design service recovery strategies, it is uncertain if these strategies will work. More research needs to be carried out to determine how service recovery can be done in the case of a technological failure, and if these strategies will affect customer loyalty.

On the other hand, to generate greater interest for hotels to introduce SSTs, hotels need to be aware of the types of government assistance and funding available. The Singapore

Tourism Board for example, has introduced a 10 million dollar co-funding initiative known as the Tourism Technology Fund to encourage technology innovation and adoption in tourism businesses. The aim of the fund is to enhance the visitors' experiences and to add value to businesses. This fund will benefit hotels who are interested in adopting SSTs, and is a platform for hotels and the government to share their resources. Hotels who qualify for the scheme will be entitled to up to 50 % of funding (Singapore Tourism Board, 2010).

In order to attract more hotels to introduce SSTs, the Singapore Tourism Board and the Singapore Hotel Association should work together to persuade hoteliers to move towards SSTs to alleviate current issues. A pilot project can be implemented in Singapore to serve as a platform for the testing of SSTs. The Singapore Tourism Board can also recommend and educate hoteliers on the success stories of SST implementations in overseas markets. It is also highly recommended that the government institutions work with chain hotels that already have the existing knowledge and expertise from their overseas counterparts to launch these SSTs in Singapore. With hotels and the government working together, it is likely that SSTs will be able to gain a foothold in the hotel servicescape.

Conclusion

With SST gaining popularity globally hotels in Singapore should consider introducing SSTs to their customers. The research has revealed the rising number of issues faced by hoteliers in Singapore. With customers demanding higher level of services, hotels in Singapore are facing difficulties providing higher service levels due largely to, manpower shortages in the industry. Customers are now increasingly accepting the use of SSTs in their lives. Hoteliers should take this opportunity and explore the possibility of using SSTs in the servicescape.

The effective management and implementation of SSTs can be an excellent way for hotels to improve service standards, and to create a competitive advantage. Thus, this paper

has proposed a conceptual framework to create a guide for hoteliers through the process of adopting SSTs. The framework considers the needs of the customers, and encourages hoteliers to perform a thorough assessment of the existing service gaps and lapses. The comprehensive assessment requires hoteliers to critic the use of SSTs, and to implement SSTs after considering all possible external and internal factors that can limit the success of the SST implementation.

Although this framework is conceptualized with academic sources, it provides the first step for hoteliers to implement SSTs. SSTs have shown the potential to provide outstanding service which is fast, convenient, and useful to consumers. If hoteliers can successfully introduce SSTs that can meet the expectations of consumers, SSTs can help solve the myriad issues hoteliers face today. With the funding and assistance rendered by the Singapore government, the implementation of SST will be a much easier process.

References

- Baum, T. (2002). Skills and training for the hospitality sector: A review of issues. *Journal of Vocational Education and Training*, 54(3), 343-364.
- Beatson, A., Coote, L. V., & Rudd, J. M. (2006). Determining consumer satisfaction and commitment through self-service technology and personal service usage. *Journal of Marketing Management*, 22(7), 853-882.
- Beatson, A., Lee, N., & Coote, L. V. (2007). Self-service technology and the service encounter. *Service Industries Journal*, 27(1), 75-89. doi:10.1080/02642060601038700
- Berry, L. L. (1999). *Discovering the soul of service*, New York, NY: Free Press
- Berry, L. L., Parasuraman, A., and Zeithamt, V. A. (1994). Improving Service Quality in America: Lessons Learned. *Academy of Management Executive*, 8(2), 32-45.
- Bitner, M. J., Brown, S. W., & Meuter, M. L. (2000). Technology infusion in service encounters. *Journal of the Academy of Marketing Science*, 28(1), 138-149.
- Brown, J. R., & Dev, C. S. (2000). Improving productivity in a service business: Evidence from the hotel industry. *Journal of Service Research*, 2(4), 339-354, doi.: 10.1177/109467050024003
- Cai, H. (2010, October 30). Jobless rate at lowest level in 2½ years. *The Straits Times*, pp. A1, A8.
- Chikwe, A. C. (2009). The impact of employee turnover: The case of leisure, tourism and hospitality industry. *Consortium Journal of Hospitality & Tourism*, 14(1), 43-56.
- Chin, K. Y. (2006). *Productivity and efficiency of hotels in Singapore* (Doctoral thesis. National University of Singapore, Singapore) Retrieved from <https://scholarbank.nus.edu.sg/handle/10635/15431>

- Choi, T. Y., & Chu, R. (2001). Determinants of hotel guests' satisfaction and repeat patronage on the hong kong hotel industry. *International Journal of Hospitality Management*, 20(3), 277-297.
- Choi, J., Woods, R.H., & Muramann, S.K. (2000). International labor markets and the migration of labor forces as an alternative solution for labor shortages in the hospitality industry. *International Journal of Contemporary Hospitality Management*, 12(1), 61-66.
- Clay, D. (2006). Self-service technologies: The affect on hospitality branding. *Hospitality Upgrade*. Retrieved from http://www.hospitalityupgrade.com/_magazine/magazine_Detail.asp?ID=42
- Cunningham, L. F., Young, C. E., & Gerlach, J. (2009). A comparison of consumer views of traditional services and self service technologies. *Journal of Services Marketing*, 23(1), 11-23. doi.:10.1108/08876040910933057
- Curran, J., & Meuter, M. (2005). Self service technology adoption: comparing three technologies. *Journal of Services Marketing*, 19(2), 103-114.
- Curran, J. M., Meuter, M. L., & Surprenant, C. F. (2003). Intentions to use self-service technologies: A confluence of multiple attitudes. *Journal of Service Research*, 5(3), 209.
- Dabholkar, P. A. (1996). Consumer evaluations of new technology-based self service options: an investigation of alternative models of service quality, *International Journal of Researhc in Marketing*, 13(1), 29-51.
- Fisher, G., & Beatson, A. (2002). The impact of culture on self-service on technology adoption in the hotel industry. *International Journal of Hospitality & Tourism Administration*, 3(3), 59-76.

- Fitzsimmons, J. A. (2003). Is self services the future of services? *Managing Service Quality*, 13(6). doi.:10.1108/09604520310506496
- Forbes, L. P. (2008). When something goes wrong and no one is around: Non-internet self-service technology failure and recovery. *The Journal of Services Marketing*, 22(4), 316-327. doi:10.1108/08876040810881713
- Ganesh, J., Arnold, M. J., & Reynolds, K. E. (2000). Understanding the customer base of service providers: An examination of the differences between switchers and stayers. *Journal of Marketing*, 64(2), 65-87.
- Gelbrich, K. (2009). Beyond just being dissatisfied: How angry and helpless customers react to failures when using self-service technologies. *SBR*, 61(1), 41-59.
- Griffy-Brown, C., Chun, M.W.S., & Machen, R. (2008). Hilton hotels corporation self-service technology. *Journal of Information Technology Case and Application Research*, 10(2), 37-57.
- Girman, M., Keusch, P., & Kmec, P. (2009). Faults, failures and availability in self-service technology. *Management Services*, 53(4), 44-46.
- Ham, S., Kim W. G., & Jeong, S. (2005). Effects of information technology on performance in upscale hotels. *International Journal of Hospitality Management*, 24(2), 281-294.
- Harris, L. C., & Ogbonna, E. (2002). Exploring service sabotage: The antecedents, types, and consequences of frontline, deviant, antiservice behavior. *Journal of Service Research*, 4(3), 163-183
- Hays, J. M., & Hill, A.V. (2001). A longitudinal study of the effect of a service guarantee on service quality. *Production and Operations Management*, 10(4), 405-423.
- Heskett, J. L., Jones, T. O., Loveman, G.W., Sasser Jr., W. E., & Schlesinger, L. A. (1994). Putting the service-profit chain to work. *Harvard Business Review*, 72(2), 164-170.

- Hogreve, J., & Gremler, D. D. (2009). Twenty years of service guarantee research: A synthesis. *Journal of Service Research*, 11(4), 322-343.
- Holloway, B. B., & Beatty, S. E. (2003). Service failure in online retailing: A recovery opportunity. *Journal of Service Research : JSR*, 6(1), 92.
- Huang, C. (2010, February 24). Singapore's declining birth rate one of people's top concerns. *Channel NewsAsia*. Retrieved from <http://www.channelnewsasia.com/stories/singaporelocalnews/view/1039681/1/.html>
- Huang, L. (2009, November 22). Chefs get poached. *The Straits Times*. Retrieved from <http://www.transitioning.org/2009/11/23/chefs-get-poached-sunday-times-22-nov/>
- Hughes, J. C., & Rog, E. (2008). Talent management: A strategy for improving employee recruitment, retention and engagement within hospitality organizations. *International Journal of Contemporary Hospitality Management*, 20(7), 743-757.
- Hussain, Z. (2010, February 16). Productivity target achievable: PM. *The Straits Times*. Retrieved from http://www.pmo.gov.sg/content/pmosite/mediacentre/inthenews/primeminister/2010/February/productivity_targetachievablepm.html
- Jeong, M., Lambert, C. U., & Lamber, C. U. (2001). Adaptation of an information quality framework to measure customers' behavioral intentions to use lodging web sites. *International Journal of Hospitality Management*, 20(2), 129-146.
- Jones, P., & Siag, A. (2009). A re-examination of the factors that influence productivity in hotels: A study of the housekeeping function. *Tourism & Hospitality Research*, 9(3), 224-234. doi:10.1057/thr.2009.11
- Kandampully, J., Mok C., & Sparks, B. (2001). Service quality management in hospitality, tourism, and leisure. Binghamton, NY: Harworth Hospitality Press, pp. 193-217.

- Kang, B., Brewer, K. P., & Baloglu, S. (2007). Profitability and survivability of hotel distribution channels: An industry perspective. *Journal of Travel & Tourism Marketing*, 22(1), 37-50. doi:10.1300/J073v22n01-03
- Kasavana, M. L. (2008). The convergence of self-service technology. *Hospitality Upgrade*, , 122-128.
- Kim, K., & Jogaratnam, G. (2010). Effects of individual and organizational factors on job satisfaction and intent to stay in the hotel and restaurant industry. *Journal of Human Resources in Hospitality & Tourism*, 9(3), 318-339. doi:10.1080/15332845.2010.487043
- Kim, D., Park, J., & Morrison, A. M. (2008). A model of traveller acceptance of mobile technology. *International Journal of Tourism Research*, 10(5), 393-407.
- Kumar, A. (2010, March 1). Smartphone power: How can hotels harness and manage it? *Hospitality Upgrade*, Retrieved from http://www.hospitalityupgrade.com/_magazine/magazine_Detail-ID-505-Smartphone-Power---How-Can-Hotels-Harness-and-Manage-It.asp
- Law, R., & Hsu, C. H. C. (2006). Importance of hotel website dimensions and attributes: Perceptions of online browsers and online purchasers. *Journal of Hospitality & Tourism Research*, 30(3), 295-312. doi:10.1177/1096348006287161
- Lee, C. (2010, March). Will mobile apps become a popular route for booking holidays and ancillary travel products in the near future? *Travel Trade Gazette UK & Ireland*, (2905), 18.
- Lema, J. D. (2009). Preparing hospitality organizations for self-service technology. *Journal of Human Resources in Hospitality & Tourism*, 8(2), 153-169. doi:10.1080/15332840802269791

- Lin, C. J., & Hsieh, P. (2006). The role of technology readiness in customers' perception and adoption of self-service technologies. *International Journal of Service Industry Management, 17*(5), 497-517. doi:10.1108/00564230610689795
- Lo, K., & Lamm, F. (2005). Occupational stress in the hospitality industry: An employment relations perspective. *New Zealand Journal of Employment Relations, 30*(1), 23-47
- Lombardi, R. (2010). Guests, gadgets and gizmos. *Hotelier, 22*(6), 41-44.
- Lui, T. W., & Piccoli, G. (2010). Integrating self service kiosks in a customer-service system. *Cornell Hospitality Report, 10*(6), 4-20
- Makarem, S. C., Mudambi, S. M., & Podoshen, J. S. (2009). Satisfaction in technology-enabled service encounters. *Journal of Services Marketing, 23*(3), 134-144
- Manpower Research and Statistics Department, Singapore (2010). Labor Market: Second Quarter 2010. Retrieved from Ministry of Manpower website:
http://www.mom.gov.sg/Publications/mrsd_qt1mr102.pdf
- Mattila, A. S. (2000). The impact of culture and gender on customer evaluations of service encounters. *Journal of Hospitality & Tourism Research, 24*(2), 263-273. doi: 10.1177/109634800002400209
- Mattila, A. S., Cho, W., & Ro, H. (2009). The joint effects of service failure mode, recovery effort, and gender on customers' post-recovery satisfaction. *Journal of Travel & Tourism Marketing, 26*(2), 120-128. doi:10.1080/10548400902862002
- Mayock, P. (2010, February 4). Checking in on self-service kiosks. *HotelNewsNow.com*, Retrieved from <http://www.hotelnewsnow.com/articles.aspx?ArticleId=2652>
- Messinger, P. R., Li, J., Stoulia, E., Galletta, D., Ge, X., & Choi, S. (2009). Seven challenges to combining human and automated service. *Canadian Journal of Administrative Sciences, 26*(4), 267-285. doi.: 10.1002/CJAS.123

- Meuter, M. L., Ostrom, A. L., Roundtree, R. I., & Bitner, M. J. (2000). Self-service technologies: Understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*, 64(3), 50-64.
- Microsoft. (2010). Microsoft Surface. Retrieved from <http://www.microsoft.com/surface/en/us/default.aspx>
- Min, H., & Min, H. (2005). The comparative evaluation of hotel service quality from a managerial perspective. *Journal of Hospitality & Leisure Marketing*, 13(3), 53-77.
doi:10.1300/J150v13n03_04
- Ministry of Manpower (2010). Job Vacancies 2009. Retrieved from Ministry of Manpower website: http://www.mom.gov.sg/Publications/mrsd_JV2009.pdf
- Nessler, D. (2010). Mobile apps are only part of the tech solution for hotel brands. *Hotel Business*, 3, 3.
- Ostrowski, C. (2010). Check-in kiosk risk/reward potential has polarizing effect on deployment. *Hotel Business*, 19(8), 12-14.
- Parasuraman, A. (2000). Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research*, 2(4), 307-320.
doi:10.1177/109467050024001
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40
- Pizam, A. (1999). The state of travel and tourism human resources in Latin America. *Tourism Management*, 20, 575-86
- Pizam, A., & Shani, A. (2009). The nature of the hospitality industry: Present and future managers' perspectives. *Anatolia*, 20(1), 134-150.

- Poulston, J. (2008). Hospitality workplace problems and poor training: A close relationship. *International Journal of Contemporary Hospitality Management*, 20(4), 412-427.
- Ramesh, S. (2010, February 23). MOM releases details on foreign worker levy changers. *Channel NewsAsia*. Retrieved from <http://www.channelnewsasia.com/stories/singaporelocalnews/view/1039314/1/.html>
- Saad, I. (2010, February 26). Observers say hike in foreign worker levy may also impact consumers. *Channel NewsAsia*. Retrieved from <http://www.channelnewsasia.com/stories/singaporelocalnews/view/1040197/1/.html>
- Schetzina, C. (2010). Mobile update: Adoption, innovation... location! *PhoCusWright Report: Global Edition*, 1-8.
- Serlen, B. (2010). Hilton looks to take mobile applications to the next level. *Hotel Business*, 4.
- Shaw, R. (2004, January 12). Hotels test self service kiosk acceptance. *Hotel & Motel Management*. Retrieved from http://findarticles.com/p/articles/mi_m3072/is_1_219/ai_112654944/
- Shoemaker, S., Lewis, R. C., & Yesawich, P. C. (2007). *Marketing leadership in hospitality and tourism: Strategies and tactics for competitive advantage* (4th Edition ed.). New Jersey: Pearson Prentice Hall
- Sim, J., Mak, B., & Jones, D. (2006). A model of customer satisfaction and retention for hotels. *Journal of Quality Assurance in Hospitality & Tourism*, 7(3), 1-23.
doi:10.1300/J162v07n03_01
- Singapore Tourism Board. (2010). Tourism technology fund. Retrieved from <https://app.stb.gov.sg/asp/ina/ina08.asp>

- Singh, A. J., Kim, H.B., & Huh, C. (2006). Differential impacts of information technology services in the Korean hotel industry: A study of management perceptions. *FIU Hospitality Review*, 24(2), 78-89.
- Sousa, R., & Voss, C. A. (2006). Service quality in multichannel services employing virtual channels. *Journal of Service Research*, 8(4), 356-371. doi:10.1177/1094670506286324
- Tay, S. C. (2010, October 30). History in a hill-top hotel. *The Straits Times*, pp. E8-E9
- Torres, E. N., & Kline, S. (2006). From satisfaction to delight: A model for the hotel industry. *International Journal of Contemporary Hospitality Management*, 18(4), 290-301. doi:10.1108/09596110610665302
- Walker, R. H., Craig-Lees, M., Hecker, R., & Francis, H. (2002). Technology-enabled service delivery. *International Journal of Service Industry Management*, 13(1), 91.
- Watkins, E. (2009). Hotel technology handbook. *Lodging Hospitality*, 65(8), 23-34.
- Watson, S. (2008). Where are we now? A review of management development issues in the hospitality and tourism sector: Implications for talent management. *International Journal of Contemporary Hospitality Management*, 20(7), 758-780.
- Walker, R. H., Craig-Lees, M., Hecker, R., & Francis, H. (2002). Technology-enabled service delivery. *International Journal of Service Industry Management*, 13(1), 91-106.
- Yen, H. R. (2005). An attribute-based model of quality satisfaction for internet self-service technology. *Service Industries Journal*, 25(5), 641-659. doi:10.1080/02642060500100833
- Zeithaml, V. A., Bitner, J. M., & Gremler, D. D. (2009). *Services marketing: Integrating customer focus across the firm*. Singapore: McGraw-Hill.