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## Using self-service technologies to solve the problem of labor shortage in Macau's lodging industry

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## **Abstract**

Macau, the world's leading gaming destination, is suffering from labor shortage. Hotels operators found it difficult to compete with the casinos for the limited human resources. In this article, the author suggests self-service technologies (SSTs) as a possible mean to solve the labor shortage problem in Macau's lodging industry. The literature review shows the seriousness of the problem, and analyze the pros and cons of SSTs, the main reason its implemented and how it is perceived by the customer. Then, base on the review, the author provides a five step implementation guide of SSTs in hotel. The author also presents recommendations for future studies, and urge the local research to explore on the topic.

**Using self-service technologies to solve the problem of labor shortage in Macau's  
lodging industry**

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## Table of Content

<b>Abstract.....</b>	<b>1</b>
<b>Acknowledgements .....</b>	<b>5</b>
<b>Part One.....</b>	<b>6</b>
Introduction .....	6
Purpose of the Study .....	7
Justification .....	7
Constraint: .....	8
<b>Part Two .....</b>	<b>9</b>
Introduction .....	9
Labor Shortage as a Challenge in Macau .....	9
Impact of Casino.....	10
Current Solution .....	10
The Impact of Labor Shortage .....	11
SSTs Introduction.....	12
SSTs Examples in the Industry.....	13
Vending .....	13
Kiosk .....	14
Web-applications.....	15
SSTs Adoption in Macau.....	15
Reasons Hotels Implement SSTs .....	16
Downside of Applying SSTs .....	17
SSTs key success factors .....	18
SSTs from Customer's Prospective.....	20
Conclusion.....	21

<b>Part Three.....</b>	<b>23</b>
Introduction .....	23
Methodology .....	23
SST Implementation.....	23
Research .....	23
Strategic Planning.....	25
System Design .....	26
Marketing .....	27
Continuous Improvement .....	28
<b>Recommendation for Future Research .....</b>	<b>30</b>
<b>Conclusion .....</b>	<b>31</b>
<b>References.....</b>	<b>33</b>

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## **Part One**

### **Introduction**

Self-service technologies (SSTs) are defined as technologies that enable customers to receive and consume the service in the absent of service employees (Meuter, Ostrom, Roundtree & Bitner, 2000; Salomann, Kolbe & Brenner, 2006). SSTs have become a changing force in hospitality industry (Lema, 2009). Services traditionally delivered by service staff, such as reservation, check-in and check-out, are now available through the internet, mobile devices, standalone kiosks or other forms of SSTs. Employees in those processes are no longer required if SSTs are implemented. In another word, people can be replaced by the machines.

Lodging has always been a labor-intensive industry, and Macau has been suffering from labor shortage since its rapid development in 2002 (Sudhir, 2006). In order to provide quality service to customer, hoteliers need to find a reliable solution to address the issue. These make one question seems perplexing: why do hotels in Macau give up on SSTs as s solution to the problem of labor shortage?

With the above question, this paper studies the reason why Macau should embrace SSTs, the benefits and the challenges of it and how it is perceived by the customer in a comprehensive literature review. It is followed by a recommended guideline about implementing the technologies for hotel managers.

## **Purpose of the Study**

The purpose of the paper is to analyze the issues surrounding SSTs and to provide an implementation guide of SSTs in hotels of Macau.

## **Objectives**

The objectives of this paper include:

1. To provide evidence that Macau needs a better way to deal with the labor shortage problem
2. To examine the feasibility of apply SSTs in the lodging industry
3. To provide a guideline for hotel managers to implement SSTs

## **Justification**

The Population of Macau is insufficient to support the huge demand from the hospitality industry, and while casinos are paying premium to the local to recruit them as dealers, it makes the situation even worse (Sudhir, 2006). The industry and government respond to this by importing laborers from China and Southeast Asia, as a result most of the front line employees in hotels and resorts of Macau are not locals. However as MOP (The Macau currency) decreases in value, the attractiveness of working in Macau is gradually diminishing. Hotel operators find it more and more difficult to get enough staff in their properties, which will affect the service level and ultimately the profitability. These make the idea of SSTs very appealing, as it can act



as a feasible substitute to labor.

**Constraint:**

There is no primary data collection involved in the study, no qualitative research nor quantitative research is conducted for the paper. All of the research is conducted through academic sources.

## **Part Two**

### **Introduction**

In Part Two, a literature review will be presented. First of all the article will explain the human resources challenges Macau lodging industry is facing by examining the labor-population statistics, how inefficient the current solutions are and the impacts to the region and the industry. Secondly the concept of SSTs will be presented and defined, with example of actual adaptation in the industry and how it has been embraced by hotels in other destination; the third will focus on the prospective of the organization, discover the benefit and downside of the technologies, as well as the critical factors determined a successful adaptation. The literature review will ended with the customer prospective to SSTs, discussing how SSTs influence their service experience.

### **Labor Shortage as a Challenge in Macau**

With over 10,000 rooms provided in the market within 10 years, it's not surprising to see Macau struggling with human resources problem (DSEC, 2000b; 2010b). In the year 2000, the total number of rooms was 9,284 and the total number of employees was 6,398, in year 2010 the respective figures was 20,174 and 26,721, a 117% and 317% difference. During the same period the total population of Macau has increased by 28% , from 431,000 to 552,000. Tourism single-handedly lowered the

unemployment rate to a low level of 2.8%- almost everyone has a job. It is good news for the society, however not so good for the hotel manager when they are still facing 5% job vacancy and 9% turnover rate in their properties. (DSEC, 2000a; 2010a)

### **Impact of Casino**

The development of gaming business directly caused the rapid growth in the hotel industry, ironically it has also caused the biggest challenge for all hotel operators- the labor issue. It is because by law, most of the vacancies in a casino, namely dealers and their supervisors, can only be filled by local workers (IO, 1961). As a labor intensive business, casinos are fighting over the limited pool of workers in order to operate their tables and slots. Governed by the basic principle of economic, the inevitable result is an increase in salaries. The average salary of a local working in a casino of Macau is MOP 15,530, while hotel can only provide MOP 10,220 (DSEC, 2010c). The 50% difference is a convincing reason for the job-seeker to deal cards rather than make beds.

### **Current Solution**

When the local workforce is not sufficient to support the job market, imported labor is always an effective solution. Back in 2000 the total number of foreign workers was only 27,221, the same figure rocketed to 75,813 in the year 2010 (DSEC, 2000a; 2010a). Of those workers 9,611 of them work in different hotels in Macau,

which means every one of three hoteliers in Macau is not holding the local ID. It hints how heavily hotel industry relies on imported labor.

Relying on imported labor is not necessarily a problem, countries like Singapore have long history of embracing imported labor and results are overall positive (Hui & Hashmi, 2007). But to achieve success in imported labor strategy, the region must be able to consistently attract high quality workers by providing competitive salary and other pull factors. Unfortunately Macau is not up to standard in this part. One of the most significant factors is the weak exchange rate.

The Macau currency, MOP, is directly bonded to HKD, which is bonded to USD. Hence MOP is indirectly bonded to USD (AMCM, 2011; HKMA, 2011). The weak USD in recent years has caused the MOP decrease in value. The mainland Chinese workers, which represent over 50% of the total imported labor, suddenly find their jobs not as attractive as before. When The RMB is expected to remain strong in the future, it is only natural for hotel managers to find it more difficult to get imported labor.

### **The Impact of Labor Shortage**

Foreseeing the potential threat of underemployment, it is crucial to understand the impact of it, one of the obvious is decrease in service quality. Using the SERQUAL model suggested by Parasuraman, Zeithaml, & Berry (1985), service

quality can be measured by tangible, reliability, responsiveness, assurance and empathy. A lack of service staff will directly influence the reliability and responsiveness of service since the staff to guest ratio is decreased, resulting in more tired employee yet still unsatisfied guests, and subsequent negative impact on guest loyalty and brand image.

Stable supply of resources is one of the key factors in sustainable development, human resources is no exception. Yet hotels in Macau are not able to secure the workforce both internally or externally due to small base of population, competition from casinos and their weak currency. The problem will only be intensified when more properties open in the near future. The industry needs a quick yet effective solution. The rational here is: when all “human” approach fails, why not try something, “non-human”?

### **SSTs Introduction**

In service, there are service provider/producer and service receiver, the former acts as an agent providing the required service to the later. Wait staff serve food to the table, maids make bed for tired guests, every form of service falls into the same pattern. The concept of self-service is to put the two roles onto one individual, making the service receiver the one who provides the service. This concept is realized through technologies. It has been widely observed across different industry such as hotels,

banking, F&B, transportation hub and sport facilities with applications like kiosks, ATM machines, online reservation website or self-operated gas stations.

### **SSTs Examples in the Industry**

There is a great variety of applications in SSTs. In lodging industry, the three most popular SSTs are: vending, kiosk and web applications. (Kasavana, 2008).

#### **Vending**

Vending is a stand-alone machine providing tangible products to customer once the payment is accepted, the prime example of which is soft drink vending machines. Cash has been the major form of payment though in recent year the number of vending accepting non-cash payment is increasing (Kasavana, 2008). Vending in a hotel can provide food and beverage items, general retail products such as souvenir, and personal hygiene etc.

The advantage of a vending is its simplicity: the product is highly exposed in the environment, customer understand what they will be getting even if he/she doesn't understand the language on the machine, also they are able to purchase the item without going through long process. In contrast, the nature of vending makes it difficult to deliver products that are complicated in nature, hence it is unlikely to find a vending that provide full dinner service. To do so it requires a more complicated and sophisticated technology.

## **Kiosk**

Kiosk is an interface that provides service, products and information through cashless transaction. Different from a vending, a kiosk doesn't display and dispense tangible products (Kasavana, 2008). One of the examples is self check-in kiosk where guest can finish the check-in process without front-office personnel. The kiosk may resemble an ATM machines, with keyboard, function keys and a display screen, however touch screen technology has gain increasing popular in recent years (Hardy & Rukzio, 2008). Guests guest browse through the interface, select the service (check/in or check out), input the necessary information (passport details, method of payment etc.) and wait to receive products and services (the key and the room number). Apart from this traditional model, researchers have suggested to extend the interface from the fixed stand-alone machine inside the hotel, to the mobile hand-held cell-phone in the hand of customer (Bergweiler, Deru, & Porta, 2010). Kiosk integrated with cell-phone is more robust in function and is likely to enhance the overall experience.

In terms of its advantage, a well design kiosk should be able to guide the customer through the process without any aid of human employee, thus it would release manpower from the frontline. However this is a challenging task considering the complexity involved. Every variables in the service process should be

customizable (bed type, check-out time, morning call service etc.) and it should be presented in a user-friendly manner so as to not turn away the customer or drag the process out longer than necessary.

### **Web-applications**

Web-applications, as the name defines, are applications on the internet where customers operate according to the instruction and receive the desired service. Online consuming has become a global phenomenon and is expected to play a more important role in the future. Hotel reservation website is one of the most adopted of its kind. Consumers are able to finish, monitor and modify their reservation through the internet without any human interaction.

Due to the fact that most of the hotels in Macau have already embrace this technology and build their own reservation website or sell their room through other online channels, this paper will not discuss its advantages and disadvantage.

### **SSTs Adoption in Macau**

SSTs are not unseen in Macau, kiosks for players' club are found in casinos where patrons are able to redeem cash or coupons with their accumulated points, there are machines where players can get chips with cash. Yet strangely enough, hotels that are just steps away from casinos somehow show reluctance to the concept, no kiosk or vending machine has been found in major hotels of Macau. (personal communication,



2011). The reason behind remain unknown due to a lack of relevant research.

### **Reasons Hotels Implement SSTs**

There are three reasons why SSTs are being introduced: Cost-cutting, increase customer satisfaction and loyalty, and to satisfy the new market. (Bitner, Ostrom, & Meuter 2002).

By eliminating service encounters, companies with SSTs are able to save considerable amount of budget in the area of human resources. By implementing a kiosk at the pool, wait staff spend less time going back and forward taking orders and delivering drinks, one check-in kiosk in the lobby represent at least 3 front-office agents in three shifts. A kiosk can work 24/7, the only variable costs are electricity, maintenance and updates, which, are considered minor if compared to the payroll of employees required.

Besides the obvious advantage of cost-efficiency, SSTs can also increase customer satisfaction and loyalty by providing efficiency and convenience. Guests now can finish their check-in within 2 minutes using the kiosk, instead of waiting in line for indefinite amount of time. Of course the premise is assured only when the system has proven to be reliable and user-friendly (Meuter et. al., 2005).

Lastly, as technologies continue to integrate with our daily life, more and more customer will expect and welcome a more high-tech approach to the traditional

service pattern, SSTs would be an appealing features for this new market. For example one researcher found that over 66% of the U.S. youth (from the ages of 18 to 34) prefer SSTs at quick-service restaurant (Avery, 2008).

However, organizations should be warned that although cost-cutting is a significant advantage, researchers consistently point out it should not be the major, or not the only reason the technologies being introduced. Rather, the system should be designed as customer-centric, only then customer satisfaction and loyalty can be achieved (Bitner et al., 2002) (Howard & Worboys, 2003). A customer-centric system will provide necessary information and friendly interface which consolidated into a pleasant user-experience; a system that is designed for cost-cutting purely, will left the user feel like an unpaid employee trying desperately working for the service he/she originally paid for.

### **Downside of Applying SSTs**

The often criticized nature of SSTs is the lack of human-touch. As much as possible hotel managers want to impress their guest in every service encounter, they are afraid that the coldness of SSTs will turn their guests away. This is legitimate since research has confirmed the lack of “social bonding” in SSTs may result low customer satisfaction and negative impact on customer loyalty (Selnes & Hansen, 2001). Also, Reinders, Dabholkar, and Frambach (2008) pointed out the forcing

customer into using SSTs will have a negative impact on the experience and may eventually drive them away from the service provider.

Trying to address this issue, Castro, Atkinson & Ezell (2010) argued that every time technology advances and trying to get rid of the redundant manpower, there were always voices complaining about the loss of human contact. Yet as time went by the original reluctance would be replaced by acceptance, and eventually it became so integrated in people's life that people would complain when the technology was absent.

### **SSTs key success factors**

In order to avoid the potential negativity of SSTs, it is important to understand what drives its success. Zhen, Nakata, Sivakumar & Grewal (2007) stated that customer readiness is the most important factor in implementing the self-service system. This view point is also supported by other scholars (Bitner et al., 2002; Matthing, Kristensson & Gustafsson, 2006; Meuter, Bitner, Ostrom, & Brown, 2005). Customer readiness describes the willingness of customer to change their established behavior and risk trying the new service channel- SSTs. Meuter et al. (2005) suggested that customer readiness for SSTs can be measured in three categories: ability, role clarity and motivation.

Ability refers to the customer's self-assessment, whether they consider themselves capable of following the instruction and get the services. The less complex the system seemed or sounded, the more likely the customers feel they have the ability to handle the system. In order to "grant" the ability to the users, the service provider must provide a user-friendly platform that is intuitive and simple to navigate for their target customer. (Dragoon, 2005)

Role clarity points to the fact that customer need to know precisely what is expected from them. If they feel uncertainty in the process, most likely they will give up on the SSTs and turn to the closest employees. This is especially important when SSTs are first introduce in the market as no one know what to expect from those ATM-like machine (Meuter at. el., 2005). To clarify the role of customer, the service provider should invest in promotion and customer education.

Lastly Motivation refers to the perceived tangible and intangible benefit customer expects to gain through using the technologies. Such benefits include money and time saved and convenience etc. Again it requires promotion and marketing effort.

Customers need to be shown what kind of benefit they will get once they switch line to a kiosk- (Dragoon, 2005).

It should be noted that different market segments may hold varied levels of readiness toward the same technology. The mature market, for example, reacts very

different to technology compares to other demographic group (Rose & Fogarty, 2010).

When bringing in SSTs it is important to understand the customer's wants and needs , decide an optimal model that customers are ready for and provide alternative to the customers who prefer a more traditional approach.

### **SSTs from Customer's Prospective**

Not to everybody's surprise, personal service is still viewed as the core of any service operation (Beatson et al., 2006). It is questionable if we can call such an experience a service if all customers do is to press buttons for themselves from the beginning to end. Even if the whole self-service process is flawless fluent and rewarding, it does not necessary guarantee a good experience. Comparing SST over interpersonal service encounter, the later is better at: providing prompt service recovery, customizing the service and provide spontaneous pleasant surprise (Meuter et al. 2000).

While the technology has great advantages in speed and efficiency, it's also its biggest disadvantage. The lack of human touch while customers receive the service may turn the experience less than desirable. It occurs particularly when the SSTs are treated as a stand-alone, separated function from the operation, where customers are all on their own, helpless and desperate. The solution is to fully integrate the SSTs in the operation process. Organization need to determine the right mix between SST and

personal service. How to maximize customer satisfaction in the combination of personal service and SSTs becomes the key question. Salomann et al. (2006) suggested the concept “High-tech, high touch” for the solution.

“High-tech, high touch” is a hybrid model in which machine and human work together and create a seamless experience in the service process. In this model, machine will be responsible for the repetitive and routine task (taking orders, checking-out) while human employee will take care of the personal side of the customer (suggest wine, planning an itinerary ). The concept is when employees are released from the routine tasks that provide little value to the customers, they have more time to spend with the customer, build relationship and solve problem for them; from the customer side, he/she spends less time waiting to be served and spend more time to be really served.

### **Conclusion**

Half a century ago there were “elevator operators”, whose responsibility was to press buttons and control the door. In just about every elevator, those handsome men and women told people with their sweet voice which floor they had arrived at. The idea of asking people to take control of the elevator themselves couldn’t be more weird and awkward. And now we all press the button ourselves.

The idea of asking guests to finish the check-in and check-out procedure by

themselves may seem equally awkward nowadays, yet if it means guests spend less time waiting in line and spend more time enjoying other services and products, the awkwardness may seem minimum. Under the potential threat of labor shortage, hotel managers in Macau should start to consider SSTs a feasible solution toward the problem. The question now is: how?

## **Part Three**

### **Introduction**

To buy a can of soda from a vending machine is easy, but to buy a soda vending machine and put it inside a property may involve more critical thinking and consideration. Implementing SSTs is in no way a simple task, just like every move in business it requires detailed planning and excellent execution. In Part Three, a five-step guide of implementing SSTs will be presented. The steps are: research, strategic planning, system design, marketing and continuous improvement.

### **Methodology**

The guideline is developed from the literature review. The concept of technology readiness (TR) plays an important role in it. The studies and researches of Hsieh (2005), Dragoon (2005) and Meuter, et al. (2005) are the also lay the foundation for the proposed implementation step.

## **SST Implementation**

### **Research**

Even though this article promotes SSTs, it's obvious that not all of the hotels are suitable or would it be advantages to implement the technologies. It depends on the readiness of customers as well as the employee. Different factors, including age,



culture background or educational level, represents different wants and needs in service. For example as mentioned previously the younger generation are more acceptant to the concept of self-service whereas the senior citizens are generally more reluctant to it. Forcing the guests to use a self-service kiosk in a property that targets the retired customer may be shutting the door for any good business. It is always important to understand the customers first.

The first step of implementing SSTs (in fact, any systems or products) is to conduct researches and understand the customer. Through survey, interview and focus group, the managers should be able to answer the following questions:

1. What are the guests' wants and needs?
2. How does service affect their purchasing behavior?
3. What are their views on SSTs?

The answer of these questions determines whether it is green or red light for the project. If the majority demands intensive social interactions and shows strong dispute against the idea of self-service, that means their TV is in a low level, and managers should give up the project for good.

Listening to the employees is crucial too. SSTs cannot completely replace human (at least not at the current stage) and hotel still needs professional employees to create excellent service experience to guests. Management will benefit from listening to their

opinions.

### **Strategic Planning**

After the research stage management should have some valuable information on hands, it is when a committee should be formed. The committee is responsible for discussing the propose and scale of the project, direct and govern the development, approve or reject the budget and monitor the outcomes. The committee should at least consist of senior management, representatives from operation, finance personnel and experts in technology. (Haley, 2003)

One of the most important tasks of the committee is to determine the strategic role of SSTs. It should give meanings to the implementation and clarify position the technologies in the operation. The committee should give answers to the following questions:

1. Why is it necessary to implement SSTs?
2. How does it fit in the existing operation?

A full examination of the existing service process by creating a service blueprint is highly recommended. The service blueprint visualize the complete flow of service encounter from pre-purchase all the way to the post-purchase stage, point out the possible fail point in the service, calculate the time needed and help analyze the profitability of each process(Shostack, 1984). The committee then can use the

blueprint to determine how SSTs can fit in the operation

It has been pointed out in the literature review that using SSTs as merely a cost-cutting method would have negative impact on customer experience (Bitner et al., 2002). How to incorporate the technologies in the strategic planning of the hotel becomes the greatest challenge at this stage. Only when it is determined, the scale of the project and the actual kind of technology used can be nailed down.

### **System Design**

The first two steps lay the foundation for the actual system design. The very first thing the committee has to decide is vendor selection. (Considering the complexity of the technologies, internal development is not likely to be an option.)

Guided by the strategic direction (and also the budget), the committee should draft a request for information, RFI. It shows the intention of a company seeking for system, with important requirements and system specification highlighted. RFI will be distributed to potential vendors, and the hotel can wait for their response.

A RFP, request for proposal is the next thing the hotel should prepare, compare to RFI, RFP is more comprehensive, and with detail specification of function, price, maintenance and other terms and conditions included. The hotel should use it as a “scoreboard” to compare between different vendors. The RFP evaluate vendors based on their reputations, product functions, supporting and maintenance promise and price

to determine the vendor. Vendor selection can be the most influential part of the development, resources and effort should be invested to ensure quality. The team will then work closely with the vendor to develop an optimal system for the properties.

Before rolling out the product to the market, it should always be tested, again and again. There are only so many ways a new product or system could go wrong, a well-design yet unstable check-in kiosk can easily destroy all of the effort. Especially when the concept of SSTs is so new to the market, it needs to be outstanding in quality to gain confidence, and it requires relentless trials and testing. (Hsieh, 2005)

## **Marketing**

When everything is ready, the marketing machine should start the engine. The main objective at this stage is to increase awareness and educate customer.

The project manager should now cooperate with marketing and public relationship department and design a promotion mix for the newly implemented SSTs. Awareness should be built among different stakeholders including customers, partners and even the rivals to ensure well reception. The customer should not only know about the technologies, they should also like it, and that's when customer education is needed. In response to the previous literature review that customer readiness determines the success of SSTs, it is important to for customer to learn about the new

technologies, not just the actual operation, but rather how they would be benefited.

The message of “convenient” “time-saving” and “user-friendly” should be brought to the customers (if the SSTs can’t be described by those adjectives, go back to system design). In order to increase motivation, the hotel could provide additional perks to increase use rate. A cash refund or coupon will pleasantly surprise those who use the check-in kiosk (Dragoon, 2005).

### **Continuous Improvement**

Although this is put at the last part of the guideline, it doesn’t mean that it should be done when everything above is over. Instead, it should always be on top of the mind of the committee and the project manager: the contingency plan, updates and maintenance and constant review of the project

One of the advantage of SSTs is the 24/7 service with consistent efficiency, yet this assertion is made under the assumption that it works properly. The truth is, every technology, however “high-tech” it is, all has its day to fail, it could be caused by bugs, operational error or as simple as a power blackout. That’s why contingency plan is so important when designing the SSTs. A system fail without proper contingency action could effectively shut down the properties until the system is restored. The more SSTs are integrated into the operation, the more robust the plan has to be and the more frequent management and employee should review and practice it. The project

manager, together with operational managers, should design the plan and constantly train the front-line staff.

“One day you’re in, the next day you’re out.” This applies to fashion, reality show, and also technology. The world of technology is changing and evolving so rapidly that it is almost mandatory to update the application in a timely manner. The once cutting-edge design would become mediocre in just one or two years time. However it should not be view as a burden, it should be treated as opportunity to provide better experience to customers. For example as the cell-phone is becoming more robust and plays a more important role in people’s daily life, it seems obvious is to integrate the guests’ cell-phone with the SSTs system to provide a smooth and more personal experience.

### **Recommendation for Future Research**

This paper is intended to persuade the hotel manager in Macau to consider SSTs in their property, yet a very important question is left unanswered: are the guests ready for it? There hasn't been any study of Macau inbound tourists regarding their readiness toward SSTs. With this gap unfilled there is not enough evidence and motivation for Macau hotel operators to embrace SSTs. Researchers should focus on the topic and conduct relevant researches.

As mentioned in the article there has already been SSTs inside Macau's casinos. Future research can examine the possibility of integrating hotel and casino using one robust SSTs application. By doing so customers enjoy a better overall experience, and the casino-hotel complex are able to provide better service since they understand the fully the customer's behavior.

It is mentioned in the paper that mobile phone has already been used as a mean to provide self-service, it shows how different forms of technologies can create synergy when combined. Researcher should explore deeper on the possibility of integrating the concept of SSTs with other technologies like motion detection, 3D projection, voice recognition etc. The seemingly science fiction today may become reality tomorrow.

## **Conclusion**

The relationship between hotels and technology has always been interesting. In the earlier days hotels tried to banned cell-phone used in propriety when they found out what the evaporation of phone call revenue, yet before long the trend had proven to be unstoppable and anyone who tries to forbid guests to use their mobile in a sightless level would be considered insane. The fear of change, the worry of uncertainty has made technological advancements that could benefit both business and customer deny unnecessarily.

Hotels in Macau should embrace the idea of self-service technology. The development of Macau couldn't advance to a higher level when it is consistently dragged by the human resources problem. There are solid evidence to clear any worry about the possibility of SSTs diminishing the customer experience; there are studies to provide hints on how to implement a successful systems; there are researches to prove the various benefit when bring in self-service in business. What's left is only intention and determination.

Macau has great potential to be a leader of SSTs in the globe, it receives millions of tourist every year, it has talents from all around the world and most important, it is a highly profitable market. While the rest of the world is suffering, hospitality in Macau is still shining. The outstanding performance on the financial statements



represents great opportunity for business experiments: there are rooms for trial and error, or even failure. If there is a time Macau should invest in technology, it is now.

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