Enhancing Parking Service Design by Service Blueprint Approach

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Abstract. A good shopping center must provide good car and motorcycle parking space, in order to meet customer demand for parking. Therefore, to improve service quality and optimize customer parking experience are still key goals for innovation. This study uses the case of Taipei 101 Mall to enhance service design based on the service blueprint method to analyze the parking principles and direction of improvement. Service blueprints help businesses establish and improve the service model of operation, and can formulate the individual service duties of the service system. It could reduce the poor linkage of strategy and culture to technology to develop services by a problem-oriented design approach. After service blueprint method is implemented, the case company's current service and deficiencies are depicted and thus new and innovative service can be designed and achieved. The new service model will become a new technological paradigm for parking services.

Keywords. service design, service blueprint, parking service, mobile apps

Introduction

Convenient traffic environment and associated outside transportation are the key successful factor of shopping mall. A good shopping center must provide the goodness of car and motorcycle parking space, in order to meet customer demand of parking. The parking lot entrance should also be planned properly and carefully to avoid affecting traffic patency. Therefore, the metropolitan shopping center enterprise should pay more attention to its parking service design. The frequent complaints about the parking service are including difficulty in finding the entrance of the parking lot, easily confused staff-only and customer-only parking spaces, difficulty in finding the mall entrance after parking, difficulty in finding a parking space, the parking discount obtained by shopping is not integrated with the automatic parking payment system, no instruction to the closest elevator to the parking space, difficulty in finding the car

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when going back to the parking lot, no instruction to the entrance or exit to desired direction, etc. Taipei 101 Mall has strived to improve these problems.

From a business perspective, information and communication technology (ICT) makes it possible to design business process more flexible and efficient (Tekes, 2007). Thus, Taipei 101 Mall wants to develop new parking service by introducing ICT. This study uses service blueprint method to analyze the parking principles and direction of improvement. Furthermore, service blueprint method was used to depict case company's current service and new service to achieve effective design of new services .Therefore, the improved quality of parking service can be achieved.

1. Service Blueprint Approach

Most early studies about service design focused more on the link with other design fields in order to establish the legitimacy of the field of service design. Many scholars suggested that the service design is the pre-stage in service development which provide great resources for creativeness (Shostack, 1982; Scheneider and Bowen, 1984; Gangadharan and Luttighuis,2009; Tung and Yuan,2008). Service blueprinting is a service modeling approach to describe accurately the service system and a sketch map for participants to easily and objectively understand the operation of the business process. It recognizes entire service of complex relationship between human, product and process (Shostack, 1984). After the description of the service blueprint, the process drills down into services, tasks and methods involved in the process, so that service providers who able to objectively understand and deal with these steps, tasks and methods. More importantly, the physical evidence and customer action in the service blueprints are clearly identified. Therefore, the service performance could be easily analyzed and defined to control and improve quality of service purposes. Some scholars considered that the blueprint can help service providers to identify the point of failure in the process, and thus can improve the service quality (Kingman-Brundage,1989; George and Gibson, 1991; Chuang,2007;Polonsky,2006).

After Shostack (1984) proposed the concept of service blueprint, Kingman-Brundage (1989) further developed the advanced version of the service blueprint by visualizing the service delivery process and showing in the overall service architecture. The structure of service blueprint is determined by four regional and three boundaries. Four areas are: the physical evidence and customer actions area, onstage contact employee actions area, backstage contact employee actions area and support processes. Three boundaries are line of interaction, line of visibility and line of internal interaction (Zeithaml and Berry, 2000). The details of the current service blueprint model and new service blueprint model was depicted simultaneously.   In this paper, the new mobile Apps of intelligent parking concept were analyzed and designed for the Taipei 101 Mall and implemented in June, 2013.

2. Case Description and As-Is Parking Service Model

Xinyi District, the top central business district known as the "Taipei Manhattan", is the most internationalized district in Taipei city where is occupied by numerous shopping malls, hotels, luxury residential blocks and corporate headquarters. Among all, the world-famous landmark Taipei 101 attracts thousands of foreign tourists a day. Taipei

101 Mall, since its opening in 2003, has become one of the most popular tourist attractions in Taiwan as the tallest building in the world and the most eye-catching landmark in the Taipei cityscape. Although the title of the tallest building in the world now belongs to Burj Khalifa, Taipei 101 is still undoubtedly attractive. However, the most frequent complaints of Taipei 101 Mall are about the parking service. In order to meet customer demand of goodness of car and motorcycle parking mechanism, Taipei 101 Mall has strived to improve the current parking service deficiencies by ICT based applications. .In the paper, we analyze the existed parking service process and find out the specific problems in the parking process, and then we design for the new service to improve the key points of the existed process based on new ICT based applications. Thus, we can design and depict the new service blueprint of the ideal scenarios for the parking service of Taipei 101 Mall.

2.1. As-Is Parking Service Process

The study illustrated the physical characterization, customer actions, front stage staff actions, back stage staff actions, and inner support activities of the parking service on the service blueprint, shown as in the Figure 1. There are three stages of the whole parking service: entering the parking lot, customers pay and go back to the parking lot, and customers get their car and leave. The existing parking service process will be described according to above three stages.

Customers who are used to drive to 101 Mall tend to have their preferred entrance and exit of the parking lot, as well as parking spaces. For example, some used to enter from the Songzhe Rd. entrance and leave from the Shifu Rd. exit, and park near an elevator or an escalator. Some may park depending on the location of the elevator closest to the boutique they are going. The scenario of the first stage is described as follows. When the customers are trying to find empty parking spaces, they often find it difficult to get clear information. The parking spaces are located on B3F, B4F and B5F, but there are no screens showing the remaining parking spaces, so customers often find the parking lot full after circling around and around before they go to another floor. In addition, the arrangement of "Staff only parking" and "Customer parking" is confusing and inconvenient. People often drive to an empty space and then realize that it is a staff only space.

As to the second stage of paying parking fees and going back to the parking lot, after the car is parked, the customers often find it difficult to get to their destination due to unclear signage to the office building and the Mall. Once they realized that they took the wrong way, they have to go back to the parking lot and try again. The shop staffs rarely actively ask customers if they need help in deducting the free parking hours, so the customers have to stop by the service centers on the 1st floor or the B1 floor before they get their cars. Since the elevator next to the service center may not be the closest to their parking space, it is not easy for the customers to find their cars. Before finding their cars, the customers need to pay and demagnetize the parking ticket at the automatic paying machine in the elevator area, and then find their cars following the parking section and space number. They can eventually leave the parking lot after they drive to the auto lane and insert the ticket.

Once the ticket is punched at the service center, the parking hours are deducted. However, the ticket should still be paid and demagnetized at the auto paying machine otherwise the car may not leave the parking lot. If that happens, the customer should drive to the manual paying lane and pay to the staff directly. However, one of the two

exits has no manual paying lane, so the customers who drive there without demagnetizing their ticket cannot leave, which causes a traffic jam in front of the gate. In that circumstance, the customer has to leave their car, walk to the automatic paying machine outside the gate, pay for the ticket, or talk to the parking office staff on the other side of the service bell and wait for help.

In regard to the third stage, after customers finish shopping and accomplish the deduction, they return to their car and leave. Because the shopping mall is huge, the elevator that customers take may not be close to the location of their cars. After customers go to the floor of the parking lot, they have to go around over and over again until they find their car. And finally, they still have to drive their car to find the exit that is best for their next destination. The scenario of finding the car and the exit is wasting a lot of time of many customers.

2.2. The Disadvantage of As-Is Model

Summarizing the customers' experience while parking, five major unpleasant failure points and one inconvenient waiting point are marked in the as-is service blueprint of parking service as shown in Figure 1.

- Failure point 1 occurs at the stage of entering the parking lot. Customers find it is difficult to find the parking spaces. Easily found available spaces are usually for office staff only. In failure point 2, after customers park, it is not easy to find the entrance to the Mall.
- In the stage of paying and going back to the parking lot, when customers finish shopping and are going back to the service center to get their parking hours calculated and deducted, they need to find the counter first (failure point 3) and check the invoice amounts and confirm parking hours (waiting point 1). They then go to another place to demagnetize their ticket (failure point 4).
- At the stage of getting the car and leaving, there are two failures. Failure point 5 is the difficulty in finding their car. In failure point 6, if customers go outside in the closest exit, it may well be the wrong exit for their next destination. These factors mentioned above are those that customers most frequently complain about at Taipei 101 Mall.

3. TO-BE Parking Service Model

3.1. Intelligent Parking Service Modules

In order to overcome the present parking inconvenience before, during, and after the purchasing process, the fuctions of smart parking position, free parking hour and smart car finding are mainly designed and merged in building 101i-parking App. The modules and functions of 101 i-parking are listed in Table 1.

3.2. To-Be Parking Service Process

After the new service designing, new functions are mainly provided to reinforce the present parking process deficiency and inconvenience before the purchase, in the purchase, and after the purchase.
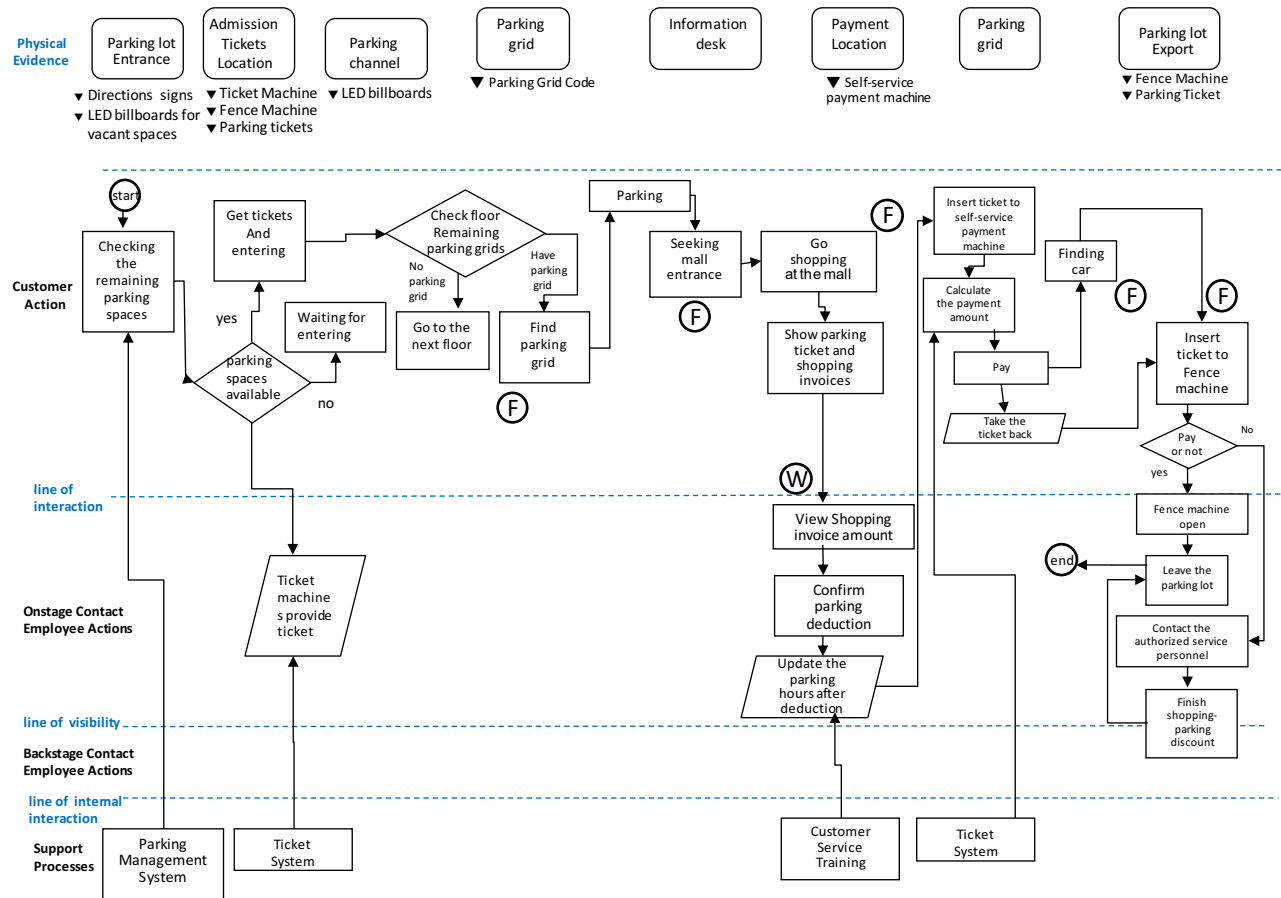
Figure 1. The as-is service blueprint of parking service

Table 1. Modules and main functions of the problem resolution

Parking Service Stage	App Modules	Main Functions
Enter the parking lot	A. Smart parking position	-Real-time parking space display on each floor -Customized parking space direction -Identifying and system record of the number plate and the parking space -Real-time recognition and recording the vehicle license -Showing direction to the Mall entrance
Pay and go back to the parking lot	B. Shopping-parking deduction	-Shopping-parking discount procedure -Showing direction to the elevator which is closest to the parking lot -Real-time calculation of parking fee without auto payment machine
Get the car and leave	C. Smart car-finding	-Customized car finding guidance -Showing direction to the exits -Showing car flow of traffic which around the exit

Comparing the new service blueprint (as shown in Figure 2) and the previous service blueprint, we can see that the difference before and after the launch of the new service. On the previous failure points and waiting point, the study designed the new service with the service blueprinting method and adopted new technologies.

- By smart parking position App, failure points 1 and 2 are improved.
  First, for the failure where it is difficult to find the parking space, it is suggested to add floor parking space displays to make it easier for customers to choose the floor to park on. Also, the legibility of the information about "Staff only" and "Customer only" parking spaces is provided through more effective instructions. Furthermore, for the failure in the new process where the customers find it difficult to find the entrance to the mall, it is suggested to combine the locating system in the smart phones and the wireless positioning, after scanning car number plates and the parking space, the app can record the parking activity for the consumers and direct them into the mall.

- Shopping-parking App can solve failure points 3 and 4 and waiting point 1.
  In relation to the shopping-parking discount, there are one waiting point and one failure point. The new service is expected to provide quick search on the current parking fees after discount and the newest discount information at any time anywhere with the smart phone app. Through the integration of shopping and parking systems, customers can get the tickets demagnetized or make payments after the discount parking hours are confirmed at the service center, so that they can get the car directly without going to the automatic paying machine.
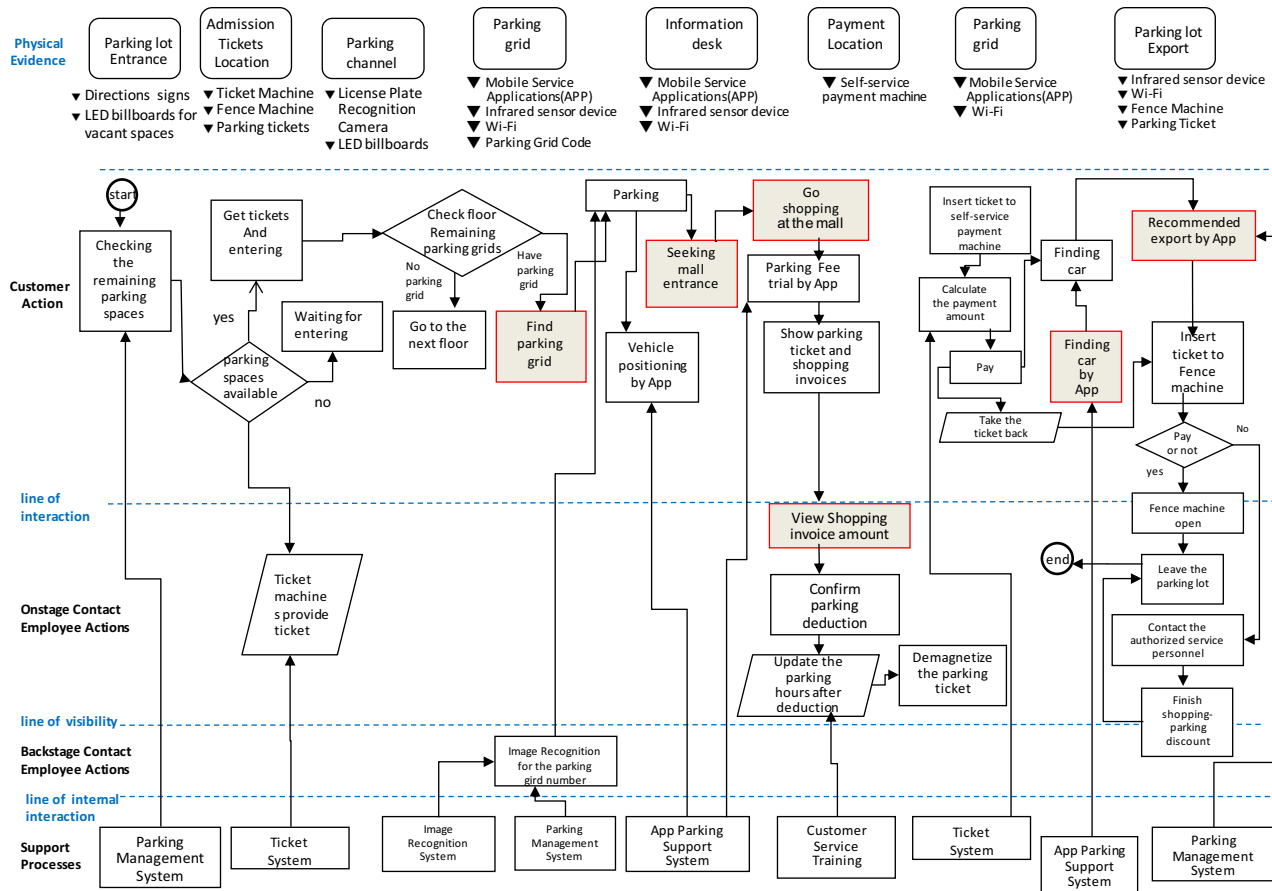
Figure 2. The service blueprint of to-be parking service

- Smart car-finding App can improve failure points 5 and 6.
  This design also solves the failure where it is difficult to find the car after shopping. The consumers just need to search for their car number on the smart phone. Using the location-based app, the sign on the map of the app can help them to find the closest entrance, the most convenient elevator and the direction to the location of the car. Lastly, after getting the car, the customers may also check the surrounding areas or the desired direction on the smart phone app, which also suggests the best exit according to the parking location.

4. Conclusion

This research depicts an intelligent parking model. The benefits the new model brings are mainly reflected in stakeholders such as parking service operators, consumers, shops at shopping malls, service providers, and service integrators. For Taipei 101 Mall, the service operator of the new parking service, the new system can provide (1) reduced customer complaints, (2) simplified operating procedures for parking, (3) reduced motivation for customers to go elsewhere, (4) improved car visit rate, (5) enhanced image of convenient shopping. For consumers, the new system can provide (1) a way to find a parking space quickly, (2) an easy route to an entrance to the Mall, (3) easier exchange parking-shopping deduction, (4) easier car location after shopping, and (5) quick and easy location of a suitable exit. According to the empirical survey, customers spend 20% less time on parking and searching for cars, and thus consumer satisfaction is increased by 25%. For the stores at the shopping center, the new system provides (1) improved customer convenience, (2) improved effectiveness of motivation to shop. The service integrator who develops the software and the parking service provider will be able to expand the market for the Mall with new products and will be able to improve the competitiveness of integrated new parking services. This academic paper is an empirical case study of an enterprise in Taiwan as it tries to gain positive performance and competitiveness from service innovation. It also contributes to enrich the service design literature in relation to services, and extends the range of applications for future parking technology.

5. Acknowledgement

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