

Research on Quality Management of Airport Service Product

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Abstract. To attract more passengers to choose flights as the most efficient and comfortable transportation, to appeal to more retailers to increase non-aviation income, to draw more airlines to buy airport service products, more and more airports are spending more money and energy on research how to improve quality of service product. This thesis analyzed many domestic and international literature, mainly based on the PMBOK Guide of PMI, and summarized the principles which are suitable for the quality management of airport service products. Then it combined with the successful cases of airports around the world to explore methods to improve product quality for three objects: passengers, retailers, and airlines.

Keywords: Quality Management, Airport Service Product, Passengers, Retailers.

1. Introduction

The development of airports is closely related to urban planning. According to the theory of the one-hour economic circle [1], as a transportation node, the airport should integrate itself into the urban economic circle, and had better play a radiation role through the quality management of core product-service, then making more profits. As an important part of project management, there are many mature theoretical systems and methodological tools of quality management available around the world; and many successful cases of research about the quality of airport service. The main purpose of this thesis is to use the theory of quality management to discuss the methods of managing and controlling service products involving the main service objects of the airport - passengers, retailers, and airlines.

Based on the core idea of quality control in project management, this paper mainly conducts research and analysis from a theoretical system structure. We analyzed much domestic and international literature and summarized the principles which are suitable for the quality management of airport service products. Combined with the data collection of airport service products, we discuss product quality control from three aspects: passengers, retailers, and airlines.

2. Research methods

The literature review method mainly refers to the method of collecting, identifying, and arranging literature and forming a scientific understanding of the facts through the study of literature [2]. The quality management theory of this subject mainly refers to the PMBOK Guide of PMI [3].

The case method is a scientific analysis method that conducts thorough research carefully on representative things (phenomena) to obtain a general understanding. The ideas involved in specific service products in this subject are partly derived from the study of the successful cases of the individual airport [4].

SWOT analysis is a method commonly used in strategic research, that is, to find out the strengths and weaknesses of the enterprise and the core competitiveness of the enterprise, to organically combine the strategy of the enterprise with the internal resources of the enterprise, and the external environment. It is mainly applied to service strategic planning analysis [5].

3. SWOT Analysis

American Society for Quality defines quality as characteristics of a product or service that bear on its ability to satisfy stated or implied needs [6]. Based on the Chinese National Standard (GB/T19000-

2000), quality management is defined that the coordination activities of commanding and controlling organizations in terms of quality. Combining the two definitions, we can consider that quality management is the sum of all management activities such as planning, organizing, planning, implementing, inspecting, monitoring, and auditing to meet customers' requirements. In other words, modern quality management has been extended from simple product technology management to strategic planning that can bring core competitiveness to the enterprise. We use SWOT to do a service strategy analysis, as shown in Table.1.

Table 1. Service strategy analysis

Internal resources External environment	I Strengths 1.Service advantages 2.Service management experience 3.Creative work	II Weaknesses 1.Bottleneck of service development 2.Low integration level of service source 3.Imperfect service planning
III Opportunities 1、Abundant referential cases 2、Multi-strategy support	V Opportunity-Strength 1.Combining experience to find new development direction 2.Using technology to improve product quality	VI Opportunity-Weakness 1.Based on others' experience to solve problems 2.Manage risks
IV Threats 1.Competition from different industries 2.High cost of remoulding	VII Threat-Strength 1.Definite core competitive power 2.Scientific planning	VIII Threat-Weakness 1.Analyzing difficulties

3.1 Opportunity-Strength Strategy

In this part, we need to seize the opportunities from the external environment, and use our strengths simultaneously to do more improvement.

Combining experience to find a new development direction. Through the accumulation, airports can summarize the useful experience of successful and unsuccessful cases from daily work. When we rearrange and reanalyze old data and information after a while, and combine some new information and ideas, we usually can create some new methods which are suitable for the current situation. Apart from that, we also can use accessible successful cases from other airports or other companies in different industries to find inspiration. In recent years, we prefer to absorb various information from other industries to change conventional concepts or even some stereotypes. At last, if airports can insist on this virtuous cycle for a long time to mix useful information, they can create some new solutions to perfect traditional ways and make a big improvement.

Using technology to improve product quality. Because intelligent airports are a flourishing trend, many airports are investing more money in it to optimize the process and improve the quality of service products which can promote the satisfaction of service objects. For example, the widespread of self-service not only can improve work efficiency but also can decrease the complaints caused by the long queue. However, airports also need to remain traditional ways for some old people or people with special requirements. In the meanwhile, we can use some policies imposed by the government funds improved by CAAC (Civil Aviation Administration of China) to promote the application of advanced technologies, such as big data, blockchain, VR, AR, and so on. For example, the One Belt One Road initiative [7] can provide many unique opportunities for airports.

3.2 Opportunity-Weakness Strategy

In this part, start we need to take advantage of opportunities from the external environment to cope with our weaknesses.

Based on others' experience to solve problems. Many airports may meet similar or even the same dilemmas. The quickest and most effective way to deal with this is that mimic others' methods and

adjust some details. The critical step to duplicate others' successful cases are information sharing which can get support from a multi-strategy policy. During the era of globalization, if one company wants to dominate more market share nor most situations, oligopoly and pure monopoly [8] are not the best choice or even impossible. Because not every company can undertake risks independently and have enough financial capability to eliminate other companies to share marketing. So we can take advantage of the mechanism established by the government to share some information and cooperate to achieve high benefit benefits.

Manage risks. Risk is nothing that would happen at any time but we don't have anyways to avoid it. However, based on the theory written by PMI, we can reduce or transfer it. For example, everyday airport complaints complain about infrastructure, such as the temperature of the terminal. The popularization of social media makes some passengers post some information he different social platforms which is bad for the image of airports. Because every passenger has different feelings and perceptions about temperature, it's impossible to find a temperature that is suitable for everyone, we only can satisfy most passengers' requirements based on some standards. For other passengers, we do our best to explain it if they are willing. In this case, although we can't make every passenger satisfied, the level of risk is decreasing gradually.

3.3 Threat-Strength Strategy

In this part, we can use our advantages to overcome threats caused by other airports or other industries.

Definite core competitive power. If airports want to compete with others, the necessary characteristic is core competitive power. For example, nowadays, a comprehensive transportation network is an irreversible trend. As a member of it, airports have to take part in fierce competition with other transportation in a shorter distance. High-speed rail has dominated some market shares that belonged to airports in the past. To solve the declining trend, airports need to do novel and productive product products to attract old and new passengers. Transferring airliners to carts at planes that transport fresh fruits or flowers is a good practice.

Scientific planning. Every year, many airports spend a lot of money on molding and purchasing new installations cause of the perfect plan. Apart from that, the noise caused by construction may have a bad effect on passengers, and the potential risk of construction bothers her passengers. So we need to pay more attention to the designing phase. Although we can't predict every change in the future, we'd better avoid deformation caused by unreasonable and inconsiderate design.

3.4 Threat-Weakness Strategy

In this part, airports try their best to decrease the influence caused by internal weakness and external threat threats.

Analyzing difficulties. When we are in a dilemma containing internal weakness and external threat, we need to analyze in the round every possibility and the seriousness aa and use a risk matrix [9] to classify the level of risk. Then we solve the most emergent and serious problems and solves others gradually based on resources. The following discusses the implementation of some strategic plans from the specific path:

(1) Clarify customer requirements. When airports provide service products, they often consider whether to provide suitable products that meet the requirements or high-quality products that exceed the requirements. To solve this problem, we can use PMI gilding theory to analyze. According to the PMI point of view, airports should provide customers with the promised products, rather than extra things. From the perspective of opportunity cost, the opportunity cost of gilding is relatively large. Considering the limited resources in the project, it is more appropriate to spend resources on meeting the established requirements of the project than on additional needs. Therefore, creating their core service product, rather than simply and deliberately imitating successful cases can better control the quality of the service product. For example, the services provided by airports usually have a quality gap [10], that is, the distance between the specific perception of the service objects and the

expectations of the airport. When referring to the most appropriate quality gap, many people think that the bigger the quality gap, the better the service product is. We usually find that surprising activities prepared for passengers do not always bring prospective results. On the contrary, some basic service services will leave an extremely bad impression on passengers due to their imperfections. Therefore, a suitable value for the quality gap is 0, that is, all we need to do is meet customers' expectations.

(2) Anticipate cost savings. In the past, people paid more attention to the inspection of output products or services, while ignoring preliminary prevention. However, through the development of cognition and the accumulation of production experience, people have found that the best way to save cost is that doing things right the first time. The cost loss caused by unqualified products is far greater than the cost of making qualified products because, in addition to economic costs, many hidden costs cannot be measured with money, such as reputation, brand, value, etc. In short, to do a good job in quality management, we should adopt a pre-prevention mechanism rather than correct mistakes in the event or modify them after the event. For example, it's normal that we need to rework due to planning issues and low satisfaction when providing products to service objects at the airport.

(3) Continuous Improvement. Product quality improvement is a step-by-step process, and it is impossible to do everything most satisfied at one time. To start with, the PDCA cycle is the basis of quality improvement. Because large improvements need longer time and greater economic costs, it is often more realistic and more valuable to reach large improvement through continuous small improvement than instantaneous large improvement. Furthermore, carrying out SWOT analysis timely can adjust the strategic deployment in time and solve the bottleneck problem in a targeted manner. According to the principle of Pareto principle, the least cost can be exchanged for greater benefits. For example, the quality improvement of airport service products is a dynamic management and control process.

4. Quality management practice of airport service product

The main service objects of the airport include passengers, retailers, airlines, etc. Now we will discuss how to improve the service quality for the three types of service objects in combination with the theoretical content of Chapter 3.

4.1 Optimizing the process to improve passengers' satisfaction

Passenger satisfaction has always been an important indicator to measure the service quality of an airport. There are many ways to improve it, such as improving hardware facilities, providing differentiated services, and improving the staff service quality. But the core of improving passengers' satisfaction lies in understanding their needs and completing process optimization. Taking departure as an example, first, the service process can be divided into three parts: processing time outside the restricted area (before you finish security inspection), duration of stay, and boarding time. Then we analyze the proportion of the three types of time for different types of passengers. For example, business passengers are looking for an efficient and fast transit experience, and we should pay particular attention to the shortening of the first and second categories of time; tourist travelers may need to go shopping or learn more about local culture. We can optimize the first and third categories of time to provide more relaxing time in the second phase. Second, we can analyze carefully all process nodes in each period to find ways to improve efficiency. For example, the introduction of self-service can significantly shorten the first type of time and can reduce the anxiety and dissatisfaction caused by the long queue, which can create a stress-free flight experience. We also can optimize the commercial layout and leisure and entertainment facilities to increase the passengers' satisfaction.

4.2 Planning to improve retailers' satisfaction

In 1987, the British first discovered the business opportunities in the airport terminals. Later, the commercial service models of the terminals of various countries flourished. In recent years, the non-aviation revenues and operating performance of Cairo International Airport [11] are exemplary in the industry. However, the development of commercial services in the terminals of many domestic airports is slow for two reasons. First, the retail shop layout of the airport is not organically integrated with the commercial functions, and the commercial layout is not well integrated with the passenger flow, which cannot leave a good impression on passengers. In addition, the commercial layout planning of the terminal building has not been effectively integrated with the airport economic zone, and there is a lack of interaction with the surrounding economy. Second, the establishment of a commercial information data platform was not considered in the business planning phase. Due to the lack of passenger information, it was unable to effectively support the optimization and adjustment of business formats and carry out targeted promotional activities.

Therefore, to achieve scientific marketing, we should combine airports, retailers, and passengers as a community of interests. At the same time, we can place, and create a full-process service product. For example, to establish a passenger loyalty mechanism, American Airlines developed a competitive weapon-FFP (frequent flyer program) in 1981. Countless airlines have testified and perfected the reliability and practicality of this program [12]. Therefore, after comparative analysis, a job in the commercial development of the terminal, airports, and retailers can also establish a business frequent buyer system. The breakthrough point of the establishment of the system lies in the needs of passengers, and the method of utilization is big data analysis. First, establishing an information platform. Retailers can analyze and mine frequent buyer information, locate their needs accurately, then adjust marketing decisions in a timely and reasonable manner. In the meantime, airports can monitor retailers' behavior in real-time through the platform. Second, in the commercial planning of the terminal building, the airport should take advantage of its logistics and transportation advantages to provide convenient, fast, safe, and considerate logistics services for businesses and passengers. Third, considering the limitations of the storefronts in the terminal building, it is possible to consider establishing corresponding points in the airport economic zone to facilitate product supply. Fourth, further promoting the application of the Internet and accelerating the transformation of capital flow.

4.3 Continuous optimization to improve airlines' satisfaction

In addition to the location advantages, one factor which affects airlines' decisions of exploring new routes is the quality of service provided by the airport. For airports to meet standards that airlines are satisfied with, it is crucial to continuously improve service quality. The apron is an area where airlines operate frequently, so the guaranteed quality of this area directly affects the operation quality of airlines. To begin with, device sharing. Problems such as chaotic management of facilities and equipment on the apron, many responsible units, and low resource utilization have seriously restricted the improvement of the apron management level. In this regard, the airport can develop a sharing platform. First, it can reduce the procurement cost of airlines. Second, the reduction of facilities and equipment on the apron can also improve the safe operation margin of the aircraft. Third, the use of scanning codes and other technologies can trace equipment usage, providing evidence support for the investigation of unsafe incidents. Moreover, security guarantees. After the COVID-19 pandemic, air transportation would gradually recover, or even increase rapidly, and the safety of the apron will become an important factor affecting the flight safety of the airport, the rapid growth of passenger and cargo throughput, and the improvement of operating efficiency. In that regard, we can learn from the automatic management of A-SMGCS (advanced-surface movement guide and control system) implemented by large airports around the world, and improve the security assurance capability through the information system [13]. At the same time, we can also refer to the idea of passenger flow optimization to sort out the bottleneck problems of important security nodes and improve them.

5. Conclusions

If airports want to improve the service product quality, they need to obey three rulers: clarify customers' requirements, anticipate cost savings, and continuous improvement. Then we can explore specific measures based on these principles. In this thesis, we classify the objects into three types: passengers, retailers, and airlines. In the future, we can choose one type of object to do in-depth research.

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