Research on the Application of Smart Technology in China Budget Hotels Based on Quantitative Analysis

--A Case Study of the Vienna Hotel

Zhiyu Zhang[1], Qifeng Yin[2], Zixin Huang[3], Yanhong Liu[4]*

[1]Industrial Development Research Center of Sichuan University, Chengdu, China
[2]Faculty of Economics and Business Administration, Yibin University, Yibin, China
[2, 4] Business School of Sichuan University, Chengdu, China
[3, 4] School of Physical Education, Shenzhen University, Shenzhen, China

[1]1075393538@qq.com
[2]383918573@qq.com
[3]958141314@qq.com
Corresponding author: [4*]lucyliu@szu.edu.cn

Abstract. Due to the fierce market competition and the heavy impact of Covid-19, budget hotels are facing great challenges. In order to maintain competitiveness, it is necessary for budget hotels to have a smart technology solution system from a customer perspective in order to win customers at a relatively low cost. This study takes the Vienna hotel in China as a case study to investigate the customer characteristics of budget hotels. A total of 310 questionnaires were collected from an online survey, and quantitative analyses were used to assess 15 hotel service items, 8 customer suggestions, 6 information channels, and a series of hotel selecting criteria of customers and potential customers. The findings show that the speed of check-in/out and considerate staff service; the marketing; the facilities and safety are the most important aspects that need to be upgraded with smart technology. We include these critical and valuable elements in the customer preference model diagram. Based on this model diagram, a smart technology application system is proposed in which there are three sub-systems, including smart facilities system, smart marketing system and smart service system. The detailed designs of each subsystem include technology applications such as room facilities controlled by voice commend; facial images and room card identification system, smart robot delivery, smart facilities with digital games, virtual tours and smart fitness functions; virtual experience based on live streaming and VR technology; synchronous virtual interaction on social media platforms; surrounding information promotion based on the GPS and mobile technology.

Keywords: China Budget hotels; the Vienna hotels; Smart technology; Quantitative analysis

V. Escudero et al. (Eds.): BADS 2022, AHCS 11, pp. 1253–1262, 2023.
https://doi.org/10.2991/978-94-6463-102-9_129

1 Introduction

Smart technology refers to information and communication technologies, including the Internet, big data, cloud computing, mobile technology, artificial intelligence and so on. In recent years, it has been widely used in various fields. The applications of smart technology in the hotel industry may start in 2018 [1].

By January 1, 2020, the number of budget hotels has reached 288,000 with the budget rooms 11.496 million. However, due to the covid-19 crisis and intense competition, the application of smart technology has signaled potential in the budget hotel industry. The competitiveness of a budget hotel lies in its excellent customer experience at a relatively low cost. In order to win customers, smart technology should be used in budget hotels according to customer preferences.

Therefore, this study aims to propose a system of smart technology based on the response of target customers and potential customers. Aspects in the operating and management (O&M) should be comprehensively considered. Pie charts, bar graphs and tables were used to clearly and intuitively demonstrate customer preferences. Based on the customer preference, we proposed a smart system with three sub-systems including smart facilities system, smart marketing system and smart service system in this study, so as to help budget hotels to win customers at a relatively low cost in current intense competition.

2 Literature Review

The origin of the budget hotel may date back to the 1920s in the US. There is no generally accepted definition of it. Previous literature commonly used “limited service” and “economy” to describe it [2]. Fu (2021) defined it as hotels which are professional and standardized in management with high delivered value and brand reputation [3]. According to Zhang (2017), the budget hotel is characterized by economy, high quality, clear market positioning, and streamlined staff management [4]. This study defines the budget hotel as: the hotels targeting customers with stable income in the middle class and focusing on guest room service with price of less than 400 yuan per room per night provide with the safety, hygiene, comfortable environment and high quality of service.

With regards to the analysis of customer characteristics, Simangunsong (2021) analyzed purchasing behaviour to identify the factors affecting customer satisfaction of budget hotel [5]. In terms of management and service, Xu et al. (2017) studied what kind of innovation can improve the perceived value of budget hotels [6]. More scholars focused on budget chain hotels from the perspectives of strategies, business model, core competitiveness and so on [7-9]. However, scholars such as Huda (2022) started to investigate budget hotel customers from digital angle [10], Liu et al. (2021) and Hidalgo et al. (2022) cared about adjusting the strategy to overcome the covid-19 crisis [11-12]. In summary, relevant research after the pandemic is meaningful, but still insufficient, and research on the Vienna hotels in China is scarce.

Founded in 1993, the Vienna Hotel is the world's first chain hotel with the theme of "music art". With the experience gained from international hotel management over the

past 24 years, it has become a leading brand in mid-range boutique hotel chains. According to statistics, the hotel has a market share of 28.27% in China. In this study, we use the Vienna hotel as an example to analyze the characteristics of customers in order to provide inspiration for the sustainable development of budget hotels and make full preparation for the post-pandemic era.

3 Research methods

A questionnaire survey was used and a total of 19 questions were investigated. Due to the Covid-19 pandemic, questionnaires were distributed online. A total of 310 questionnaires were collected during 1 week, of which 300 were valid. The effective rate was 96.8%. Finally, SPSS and other software were employed to analyze the data.

We analyzed customer characteristics from demographics, perception and behavior. And we try to have a deep understanding of customers to explore how to use digital technology to maintain the development of budget hotels.

According to the survey, the majority of customers are aged 18-30, accounting for 83.67%. Therefore, it can be found that young groups aged 18-30 are the target market of Vienna hotels. The frequency of samples in income groups shows a declining trend. It shows that the majority of customers of the Vienna hotels have a monthly income of no more than 6,000 yuan RMB. In addition, the majority of customers in Vienna hotels are predominantly composed of students and employees, accounting for 55.33% and 17% respectively. In summary, the target customers of the Vienna hotels are those who are well educated with a stable income and independent spending power.

4 Statistical analysis and results

4.1 Statistical analysis of customer satisfaction of 15 hotel service items

This survey assessed the Vienna hotel services according to 15 items including the hotel location, the overall situation, the guide signs, the staff service, the room layout, the room bed comfort, the room sound insulation, the toilet articles quality, the room security, the room bath facilities, the room network speed, the catering services, the entertainment facilities, the check-out and check in speed. Participants scored the 15 items according to their experience. (1 very dissatisfied, 2 dissatisfied, 3 neutral, 4 satisfied and 5 very satisfied).

Table 1. Ranking of customer satisfaction of 15 hotel service items (Owner-drawing)

Oder of importance	Items of hotel services	The Maximum	The Mean	The Standard deviation
1	Speed of check-out	5	4.17	0.735
2	Speed of check-in	5	4.17	0.731
3	Comfort of room beds	5	4.1	0.757

4	Overall situation	5	4.06	0.762
5	Staff service	5	4.06	0.829
6	Safety	5	4.03	0.754
7	Room layout	5	4.02	0.755
8	Guide signs	5	4.00	0.856
9	Hotel location	5	3.99	0.805
10	Bathroom facilities	5	3.92	0.852
11	Network speed	5	3.92	0.881
12	Catering service	5	3.78	0.92
13	Sound insulation	5	3.75	0.996
14	Room toiletries	5	3.71	0.977
15	Recreational facilities	5	3.66	1.001

On the basis of the scores of 143 guests who once lived in the Vienna hotels, it was found that the speed of checking in and out received the highest score (4.17 points), followed by the comfort of room beds (4.1 points), and the service of staff (4.06 points).

In summary, according to the results, we identified the services including speed of check-in/out, the facilities including room facilities and safety facilities as important aspects of the smart technology application.

4.2 Statistical analysis of customer improvement suggestions

As shown in the Fig. 1, the results show that customers consider room facilities, room safety and hotel publicity as the shortcomings, accounting for 45.45%, 39.86% and 25.17%, respectively.

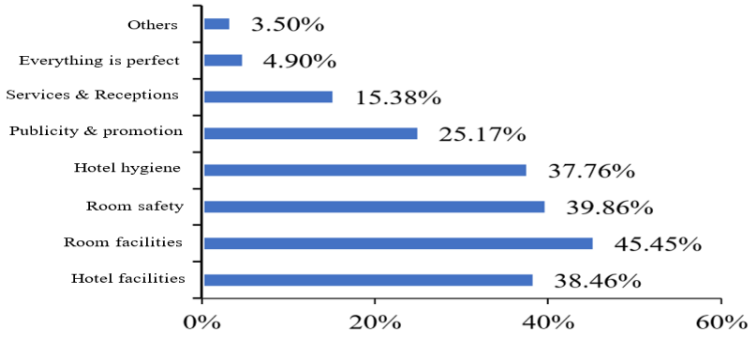

Fig. 1. Customer improvement suggestions (Owner-drawing)

In summary, according to the results, we consider room facilities, safety and marketing as elements that should be emphasized in the proposed smart technology application system in this study.

4.3 Statistical analysis of customer information channels

According to the survey, customers know about the Vienna hotels mainly through online booking platforms (52.22%), social media (36.67%) and friends introductions (36.67%).

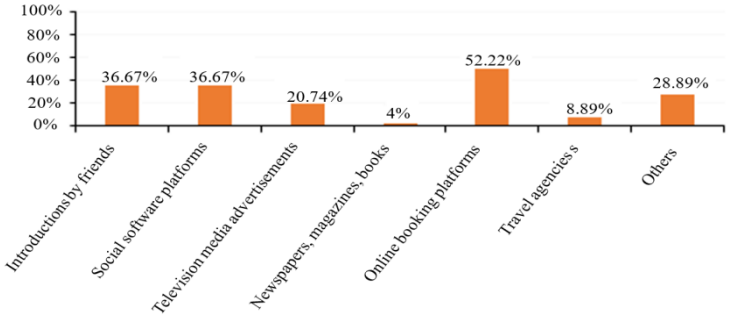

Fig. 2. The information channels of customers (Owner-drawing)

Thus, the online preservation platforms, social media and online social interactions should be emphasized in the proposed smart application system in our study.

4.4 Statistical analysis of customer hotel selecting criteria

As shown in Fig.3, more consumers tend to select hotels according to the location (32%), the brand (29%) and the price (15%). Then they will consider the service (10%) and decoration (10%).

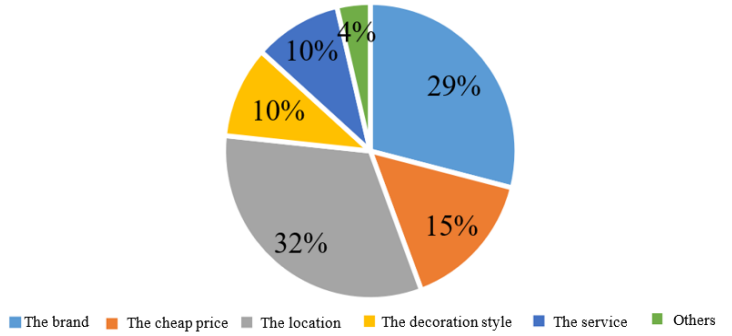

Fig. 3. Hotel selecting criteria of customers (Owner-drawing)

Thus, we identify the surrounding information promotion and the marketing including price and brand as important elements of smart technology application system.

4.5 Potential customer behavior characteristics analysis

There are 157 respondents in this survey who have never lived in a Vienna hotel before. However, they also put forward suggestions. Therefore, they can be seen as potential consumers. When selecting a hotel, these potential customers tend to consider the location, the facilitates completeness, accounting for 78.34% and 53.5%, respectively. With regards to the service, potential customers hope for high speed Internet (68.15%), shuttle service (37.58%) and multiple dining options (37.58%).

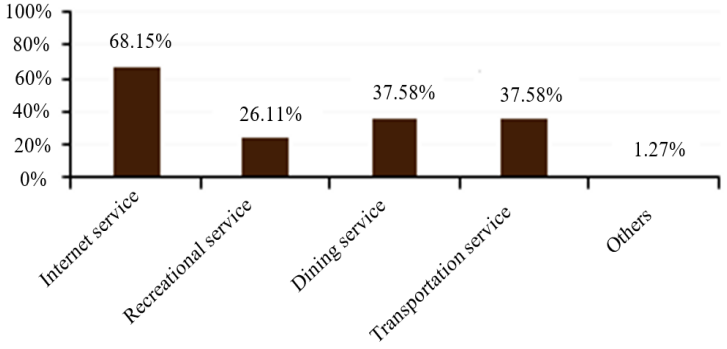

Fig. 4. Hotel selecting criteria of potential customers (Owner-drawing)

According to the results, we also identified the Internet service, catering services and transportation information as main elements of the proposed smart technology application systems.

In summary, the smart technology application system based on the customer preference should be proposed from three aspects, which is shown in Fig. 5.

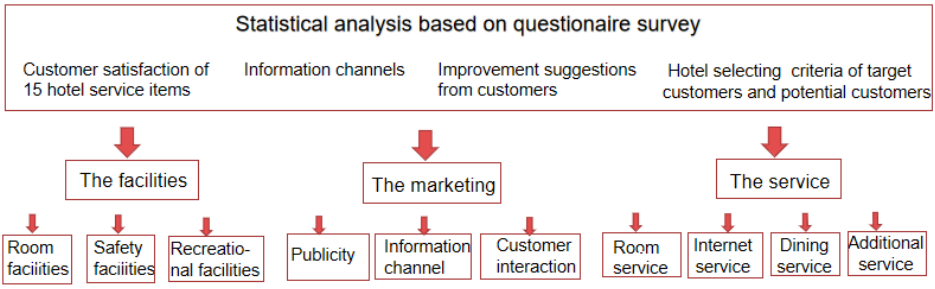

Fig. 5. Budget hotel customer preference model diagram (Owner-drawing)

5 The application of mart technologies in Vienna Hotel

5.1 The smart technologies of application in supporting facilities

According to the survey, it is recommended to apply smart technology to the internal facilities of Vienna hotels: first, guest rooms. According to statistical results, customers are relatively young and hope for updates of room facilities. Thus, budget hotels can

integrate smart technology into the upgrades, such as smart mirrors, toilets, dryers, air conditioners, and lights that can all be controlled by voice. Second, safety. Based on the data statistics, it is recommended to use smart technology to ensure hotel safety and privacy. For example, facial images or room cards can be used as access to guest rooms and meeting rooms to maintain an exclusive and private environment. Under the background of Covid-19, smart robot delivery in the hotel can largely reduce face-to-face contact, thereby reducing the perceived risk of Covid-19. Fourth, since most customers are young according to demographic statistics, it is important to provide smart recreational facilities, such as digital game, music enjoyment, virtual tour, exercise facilities and so on.

5.2 The smart technologies of application in the marketing

According to statistics, customers regard promotion and publicity as shortcomings of the hotel, and the brand is also crucial to customer choice. Therefore, they can also use smart technology to improve their marketing. First, hotels should promote virtual content online. Compared with words or photos, live streaming and VR are currently the most popular forms that bring a strong sense of presence. Therefore, compared with recorded videos, they are more effective in stimulating consumption behavior. Second, hotels should pay enough attention to publicity on new media, such as social media and mobile tourism shopping platforms, so as to make sure that customers can easily take them into consideration when making travel decisions. Third, they should regularly interact with customers through multiple online channels, such as online reviews, We Chat accounts, micro-blogs, online communities and so on. It has been widely confirmed in previous literature that sincere and simultaneous responses can help build trust and increase customer loyalty. By doing so, the hotel can also establish its brand reputation.

5.3 The smart technologies of application in service

It is suggested that budget hotels can integrate smart technology into their services: first, Internet service. According to the survey, a stable and fast WIFI service is necessary for budget hotel customers. Second, “fine service”. The results show that the “fine service” is attractive. Meanwhile, the application of smart technology enables budget hotels to provide considerate service at a relatively low cost. For example, smart robots can be widely used in guest rooms to provide morning calls, consultants, greetings, reminders, recreational services based on customer voice commands. In addition, the check-in/out service can be done without waiting in the app on the customer's phone. Third, dining service. A variety of dining options can be preserved on the menus on customers’ phones to meet their different needs, and the food can be sent to rooms by smart robots, which provides simple and convenient dining experience. Fourth, additional service. Hotels are recommended to make it easy for customers to search the surrounding situation, including restaurants, tourist resources and transportation information, on their mobile phones before making travel decisions.

6 Conclusions

The proposed smart technology application system for budget hotels in China with three sub-systems including smart facilities system, smart marketing system and smart service system are based on the quantitative analyses of 15 items of hotel services, suggestion from customers, customer information channel, hotel selecting criteria of customers and potential customers. The elements emphasized by customers in the survey were identified as the critical and high value aspects included in the proposed smart technology application system of budget hotels.

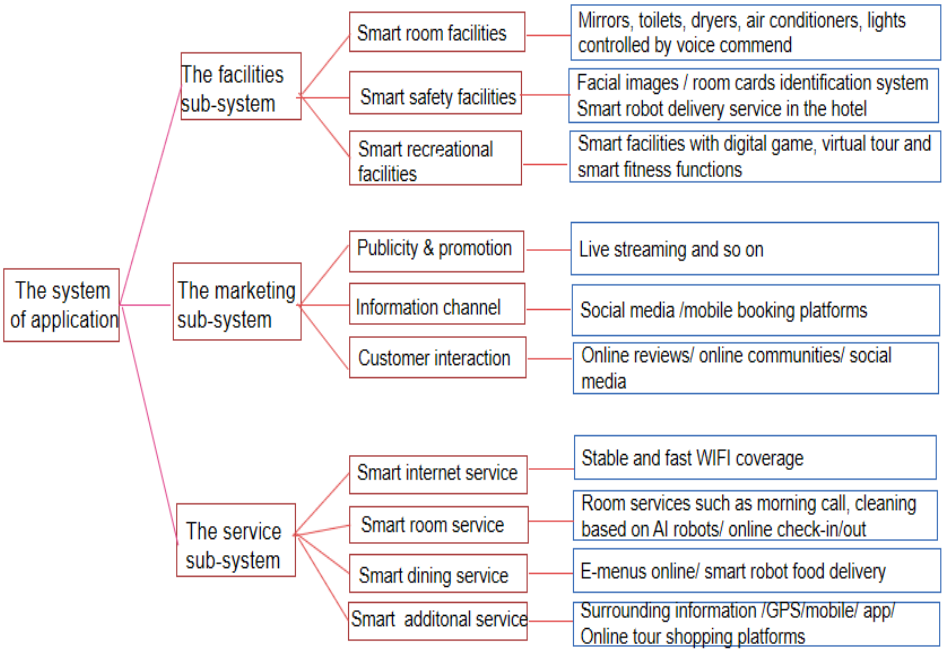

Fig. 6. The budget hotel smart technology application system (Owner-drawing)

Accordingly, this system is proposed to consist of three sub-systems. First, smart facilities system, including smart room facilities, smart safety facilities and smart recreational facilities. Second, a smart marketing system, including smart publicity, smart information channels and online customer interactions. Third, smart service systems include smart room service, smart dining service, stable and fast WIFI coverage, and smart additional services. The detailed designs of each item in the proposed model, such as the application of facial images, smart robots, virtual reality and voice commands, are listed in Fig. 6.

There are limitations to this paper. First, we focus on the perspective of customers, and we did not investigate the attitude of professional staff, such as budget hotel managers. Second, we only have normal and relative comprehensive analysis, however, in the context of the pandemic, it is meaningful to focus on pandemic-related factors and especially resolutions. In future research, we can explore smart solutions

from the perspective of hotel managers, and it is suggested to investigate pandemic-related factors and resolutions for the Vienna hotel and other budget hotels so as to meet the needs of customers in the post-epidemic era.

Funding

This research was funded by Guangdong Provincial "13th Five-Year" Plan 2020 Discipline Co-construction Project, grant number GD20XTQ03 and Higher Education Teaching Reform Project, grant number 2021SZ02.

References

1. Yang Huijun, Song Hanqun, Cheung Catherine, Guan Jieqi [J]. How to enhance hotel guests' acceptance and experience of smart hotel technology: An examination of visiting intentions. International Journal of Hospitality Management, 2021,97,103000.
2. Wen Hua, Chan Andrew, Mao Zhenxing. Critical success factors and customer expectation in budget hotel segment—A case study of China [J]. Journal of Quality Assurance in Hospitality & Tourism, 2009, 10(01):59-74.
3. Fu Yi. The operation analysis and development strategy research of budget hotel chain [J]. Operation and Management,2021(12): 63-68.
4. Zhang Juan. Analysis on the development status and strategies of China's budget hotels [J]. Business Economics,2017(04):86-88.
5. Eliot Simangunsong. The factor analysis of demographic, purchasing behaviour, and customer satisfaction of budget hotel [J]. BISMA (Bisnis dan Manajemen), 2021,13(02):121-134.
6. Xu Hong, Liu Yuqing, Liang Jia. Research on the composition and influence of customers' perceived hotel service [J]. Tourism Tribune,2017,32(03):62-71.
7. Zou Tongqian. Key success factors and business model of budget hotels [J]. Journal of Beijing International Studies University,2003(03):29-32.
8. Feng Dongming. Budget hotels: development, problems and strategies [J]. Tourism Tribune, 2006(07):58-62.
9. Wei Lingli. Research on culture cultivation of budget hotels based on core competitiveness [J]. Journal of Southwest University of Science and Technology,2016,33(03):68-71.
10. Huda, Miftachul. Digital marketplace for tourism resilience in the pandemic age: voices from budget hotel customers [J]. International Journal of Organizational Analysis, 2022(Online).
11. Liu Yanhong, Shi Yun Qiao, Lei Jia, Yao Wei. The warning and governance of online research--Based on the Crisp-Set Qualitative Comparative Analysis [C].7th International Conference on Information Management (ICIM), London, UK, 27-29 March 2021:128-134.
12. Alberto Hidalgo, David Martín-Barroso, Juan A. Nunez-Serrano, Jaime Turrion. Does hotel management matter to overcoming the COVID-19 crisis? The Spanish case [J]. Tourism Management, 2022, 88, 104395.