Tourism Management and Technology Economy (2023)
Clausius Scientific Press, Canada

DOI: 10.23977/tmte.2023.060309
ISSN 2616-2199 Vol. 6 Num. 3

Research on Customer Experience of Hotel Robot Service in Hangzhou through the Lens of Experience Economy Model

Zhouyi Chen[a], Yafang Bao[b,*]

College of Landscape Architecture, Zhejiang Agricultural & Forest University, Hangzhou, China
[a]halochen233@163.com, [b]boyafan@zafu.edu.cn
**Corresponding author*

Keywords: Hotel robot service, China, customer experience, Experience Economy Model, Hangzhou

Abstract: This study aims to reveal the key dimensions of customer experience of hotel robot service in China through the lens of Experience Economy Model. Qualitative research was conducted by analyzing 10,024 customer reviews from four typical hotels in Hangzhou. The study extended the traditional dimensions of "entertainment," "escapism," "esthetics," and "education" in the Experience Economy Model to include the dimensions of "facilities," "emotions," and "efficiency." The study not only provides a more complete and systematic description of customer experience of hotel robot service but also has important empirical significance for the application of Experience Economy Model.

1. Introduction

The integration of technologies such as cloud computing, the internet of things, and big data has brought opportunities to the tourism industry[1]. The Chinese government has issued policies to support the development of intelligent robots[2]. The hotel industry has applied intelligent robots to handle repetitive and standardized tasks, freeing up employees to manage non-programmatic affairs and provide better personalized services. After the outbreak of the COVID-19 pandemic in 2019, the need for "contactless" services further promoted the rapid expansion of the intelligent service market in Chinese hotel industry[3].

As the use of robot service in hotels is a relatively new operating mode, the customer experience they focus on may be very different from traditional hotels. Therefore, it is urgent to explore the customer experience of hotel robot service more systematically and comprehensively, providing theoretical support and decision-making basis for the hotel's optimization and upgrading of intelligent services.

2. Literature review

2.1 Current Research Status on Hotel Service Robots and Customer Experience

According to the definition of the International Federation of Robotics (IFR), service robots refer

to "the machine body that performs effective service tasks for humans or equipment, except for industrial automation application equipment"[4]. Due to the broad and complex concept of robot service, this article defines hotel robots in the service field as machine bodies that can help customers complete intelligent service tasks through computer programs, artificial intelligence algorithms, sensors, and other technologies, including voice intelligent control systems in rooms and humanoid robots with facial features and limbs.

As the use of hotel service robots is still in its infancy, there is relatively little research on customer experience in this area, and most of it is focused on foreign countries. Scholars abroad mainly explore customers' perceptions, technological acceptance, and usage attitudes towards hotel robot services. For example, Shin et al. (2020) found that customers' use of hotel robots is mostly out of curiosity, and due to the lack of emotional expression in robots, most customers still prefer human services[5]. Fuentes-Moraleda et al. (2020) analyzed the service robot acceptance model (sRAM) based on the three dimensions of function, social emotions, and relationship to determine that the function dimension in human-machine interaction is the most important factor affecting interaction and experience between robots and customers[6]. Lee et al. (2021) further studied the different behavioral perceptions of different types of customers, including ordinary customers, enthusiastic adopters, technology laggards, and value seekers, towards the use of hotel service robots, based on three functional aspects (facilitating conditions, performance expectations, and innovativeness) and three emotional aspects (social presence, pleasure motivation, and perceived importance)[7].

Domestic research mainly started after 2019, and scholars mainly focus on customers' satisfaction and usage attitudes. Yu et al. (2020) explored the relationship between customers' perceived value, service robot design, and usage attitudes and willingness to use again[8]. Sun (2022) used the Analytic Hierarchy Process to determine that customers' most concern is the personal privacy protection of service robots, followed by service efficiency and emotional service[9].

The above research has made certain contributions to understanding the customer experience brought by hotel service robots, but most of them are at the level of discovering and explaining factors that affect customer experience, lacking a systematic induction and analysis of customer experience dimensions under the guidance of theoretical frameworks. Therefore, this study will use the experience economy model as a research guidance framework to understand the customer experience of using hotel service robots in a more structured and comprehensive way.

2.2 Experience Economy Model and Its Application in Tourism Research

Pine and Gilmore (1998) believed that customer experiences are evaluated based on two aspects: passive to active participation and absorption of the surrounding environment to immersion, and they identified four dimensions, namely entertainment, education, esthetics, and escapism, known as the Experience Economy Model (as shown in Figure 1)[10]. The 4E model has been widely used in the hotel industry and other tourism-related research. For example, Quadri-Felitti et al. (2012) first used the Experience Economy Model to explain the experiential nature of wine tourism, promoting its application in tourism research[11]. Domestic scholars such as Liu et al. (2021) further applied the 4E model to research the development of domestic wine tourism and found that the ranking of domestic wine tourism experiences is aesthetics, education, entertainment, and escapism[12]. Bao et al. (2021) used the Experience Economy Model to explore Chinese guests' experience of Airbnb platform homestays and extended the model to discover eight guest experience dimensions, with the most lacking experiences being entertainment and escapism[13]. In summary, the Experience Economy Model is feasible in tourism research and can help researchers explore customer experiences more rigorously and systematically under theoretical guidance.

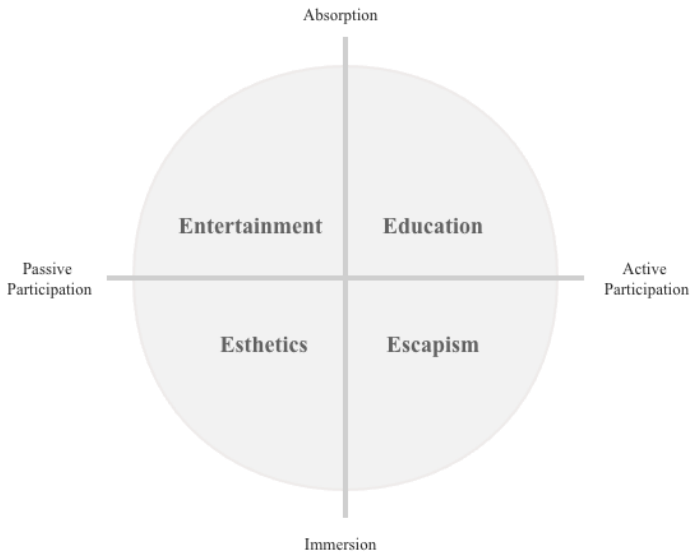

Figure 1. Components of the Experience Economy Model

3. Methodology

3.1 Research Method and Object

This study adopts a qualitative research method for content analysis to explore potential new phenomena or issues in the context of hotel robot services, as the variable of customer experience is not easily quantifiable. Online reviews are used as raw material for analysis, as they reflect customers' accommodation experiences and provide important references for potential customers' decision-making. Hangzhou, a highly focused city for digital economic development in China, is selected as the research location due to its representative tourism industry that is highly intelligent. Four hotels, including the most popular new intelligent hotels in China in the field of hotel robot services and the most popular chain hotels, are selected as research objects to enrich the sample size. The study uses the Experience Economy Model as a guiding framework to study the customer experience of hotel robot services through online reviews, providing theoretical support and decision-making basis for the optimization and upgrading of hotel robot services in China.

3.2 Data Collection

This study selects Qunar.com, a well-known OTA platform at home and abroad, as the data source and uses the Beautifulsoup library of Python language to crawl customers' online reviews. Secondly, as Flyzoo Hotel belongs to Alibaba, most customers book rooms through Fliggy platform, which is also owned by Alibaba. Therefore, we have additionally collected review data on Flyzoo Hotel from the Fliggy platform to increase the validity of the sample and make the research results more rigorous. After sorting, a total of 10,024 online reviews were obtained (as shown in Table 1). The data obtained are the online reviews recorded by the above-mentioned websites from their inception to April 2023.

Table 1. Numbers of reviews collected from tourism websites

Research Objects	Number of reviews
Flyzoo Hotel	2054
Hangzhou Weilaili Hotel	459
Ji Hotel Hangzhou Future Tech City Wanda Plaza	552
Atour Hotel Hangzhou Wulin Square North Jianguo Road	6959
Total	10024

3.3 Data Analysis

Firstly, this article uses ROST Content Mining6 software to conduct high-frequency word analysis on the text content of online reviews of hotel robot services, with the aim of extracting the most concerned elements in the customer experience. The data is cleaned and irrelevant or ambiguous word groups are filtered out to ensure the validity of the analysis. High-frequency vocabulary is extracted from the txt text based on word segmentation and merging.

Secondly, using the system coding process of "open coding-axis coding" in thematic analysis, the high-frequency vocabulary generated from the customers' online reviews in the previous step is used as open codes to further develop the theoretical construction of the raw data and extract 89 main theme factors that represent the customer experience to generate axis codes. Under the guidance of the Experience Economy Model, the axis codes are subjected to thematic clustering. To ensure the validity and objectivity of the research, this step is jointly completed by two researchers familiar with coding and the experience economy model.

4. Result Analysis

4.1 High-Frequency Word Analysis

Table 2 presents the top 100 high-frequency word in online reviews. The most frequently used words include "services", "clean", "room", "breakfast", "hygiene", and "location", indicating that customers using robot services in hotels are primarily concerned about basic services and facilities offered by traditional hotels. Nevertheless, these words such as "experience", "robots", "intelligent", "high-tech", "Tmall Jingling", "future", and "fresh" demonstrate that hotel robot services provide customers with unique and novel experiences. Words such as "children", "kids" and "parent-child" also appearance frequently. Some customers commented that they chose a hotel to allow their children to experience the rapid development of robots, which aligns with the "education" dimension of the Experience Economy Model.

Table 2. Word frequency list (top 100).

	Term	TF		Term	TF		Term	TF
1	hotel	4302	36	caring	315	71	soundproofing	130
2	services	4192	37	worthwhile	315	72	well-arranged	129
3	clean	2989	38	West Lake	307	73	downstairs	128
4	rooms	2720	39	choices	305	74	help	127
5	breakfast	2566	40	Tmall Jingling	304	75	superior	127
6	hygiene	2354	41	upgrade	274	76	toilet	126
7	ease	2244	42	next to	270	77	surroundings	126
8	location	1542	43	children	262	78	control	124
9	front desk	1259						

10	check-in	1195	44	thoughtful	259	79	curtains	122
11	rich	1176	45	metro station	257	80	drinking water	113
12	metro entrance	1150	46	tastes good	257	81	air conditioning	113
13	transportation	1148	47	milk tea	256	82	intelligent	110
14	satisfied	1132	48	high-tech	241	83	gratitude	108
15	environment	1011	49	positive feedback	238	84	machines	107
16	complete	917	50	decoration	207	85	questions	106
17	experience	909	51	restaurant	207	86	room type	103
18	next time	739	52	waiters	199	87	no staff present	102
19	convenience	678	53	handle	186	88	identification	101
20	comfortable	606	54	Alibaba	185	89	happy	99
21	robots	577	55	quiet	182	90	friends	96
22	enthusiasm	576	56	lobby	182	91	first time	95
23	attitude	550	57	elevator	172	92	design	94
24	tidy	495	58	future	166	93	kids	92
25	delicious	490	59	food delivery	166	94	relax	88
26	travel	489	60	self-service	159	95	human faces	86
27	cosy	486	61	leave	158	96	style	82
28	cost-effectiveness	477	62	hall	156	97	fresh	80
29	free	443	63	ice cream	151	98	cute	78
30	intelligence	436	64	varieties	141	99	parent-child	78
31	staff	422	65	gym	134	100	characteristic	78
32	geography	390	66	prefect	133			
33	metro	384	67	nearby	132			
34	parking	370	68	warmth	132			
35	HangZhou	325	69	TV	132			
			70	laundry	130			

4.2 Analysis of the Dimensions of the Experience Economy Model

Through repeated cross-comparison and inductive deduction of the axis codes, this study has expanded the dimensions of facilities, emotions, and efficiency based on the traditional dimensions of entertainment, esthetics, education, and escapism in the Experience Economy Model to comprehensively and systematically describe the customer experience of hotel robot services (as shown in Table 3).

Table 3. Expansion of the Experience Economy Model formed by coding.

Dimensions	Themes	Frequency	Dimensions	Themes	Frequency
Entertainment	rich	1176		milk tea	256
	experience	909		restaurant	207
	HangZhou	325		waiters	199
	West Lake	307		lobby	182
	leave	158		lift	172
	ice cream	151		food delivery	166
	surroundings	126		hall	156
	friends	96		varieties	141
	first time	95		gym	134
	fresh	80		nearby	132
	characteristic	78		TV	132
		total 3501		laundry	130
Esthetics	tidy	495		soundproofing	130
	decoration	207		downstairs	128
	design	94		toilet	126
	style	82		control	124
		total 878		curtains	122
Education	children	262		drinking water	113
	high tech	241		air conditioning	113
	future	166		machines	107
	kids	92		room type	103
	parent-child	78		identification	101
		total 839		human faces	86
Escapism	cosy	486			total 21968
	geography	390	**Emotions**	satisfied	1132
	quiet	182		next time	739
	relax	88		enthusiasm	576
		total 1146		attitude	550
Facilities	rooms	2720		caring	315
	breakfast	2566		worthwhile	315
	hygienic	2354		thoughtful	259
	location	1542		prefect	133
	front desk	1259		warmth	132
	metro entrance	1150		well-arranged	129
	transportation	1148		help	127
	environment	1011		superior	127
	complete	917		gratitude	108
	robots	577		no one	102
	delicious	490		happy	99
	intelligence	436		cute	78
	staff	422			total 4921
	metro	384	**Efficiency**	ease	2244
	parking	370		convenience	678
	Tmall Jingling	304		cost-effectiveness	477
	upgrade	274		self-service	159
	next to	270		intelligent	110
	metro station	257		questions	106
	tastes good	257			total 3774

Table 3 shows the themes and their frequencies mentioned in the seven dimensions after expanding the Experience Economy Model to reveal customers' preferences in hotels that provide robot services. The three dimensions with the highest frequency are "facilities", "emotions", and "efficiency", with theme word frequencies of 21,968, 4,921, and 3,774, respectively. This indicates that customers are still primarily concerned about the experience that traditional hotels can provide, such as facilities and basic services, while also valuing the emotional experiences that robots can provide and their

impact on service efficiency.Some customers stated, "The robot is very cute and greets me in the elevator," while others who stayed at the Flyzoo Hotel thought, "There is no enthusiastic staff here, only the robots control face recognition, and the elevator and corridor seem like death passages leading to a biochemical crisis. The Tmall Jingling is placed on the bedside as if monitoring your every move. I hope this kind of future will never happen!"

In the "efficiency" dimension, "ease" was mentioned 2,244 times. Most customers believe that intelligent robot services and self-service improve the hotels' service efficiency, but there are also a few customers who think that robot services have many "problems", such as the insensitivity of the voice control system, the failure of room face recognition, and the slow delivery speed of robots.

The themes of the traditional dimensions of "entertainment", "esthetics", "education", and "escapism" in the Experience Economy Model are mentioned 3,501, 878, 839, and 1,146 times, respectively. Customers pay more attention to the entertainment experience provided by the hotel. For example, "fresh", "first time", and "characteristic" are frequently mentioned, indicating that robot services bring customers a different entertainment experience than traditional services, which is also the first motive for many customers to choose hotels with robot services. The hotel should pay more attention to this area.

In terms of esthetic experience, customers mainly focus on the cleanliness, decoration, and design style of the hotel. In addition, the customer experience in the "education" dimension is mainly reflected in parent-child relationships, and some customers indicate that children are interested in artificial intelligence. However, because the data sample of this study is based on Hangzhou hotels that provide robot services, the commercialization of the city itself makes the experience of "escapism" mentioned less by customers. The basic function of the hotel is rest and accommodation, so customers should not ignore the quietness of the hotel.

5. Conclusion and Implications

5.1 Findings

In summary, this study analyzed the customer experience of hotels with robot services in Hangzhou based on the Experience Economy Model. The study identified the seven dimensions of customer experience that customers focus on when staying in smart hotels. "Facilities", "emotions", and "efficiency" were the most important, indicating that while robot services play an important role in smart hotels, customers still prioritize basic functional facilities. The four traditional dimensions, in order of importance, were "entertainment", "escapism", "esthetics", and "education".

5.2 Theoretical Contributions

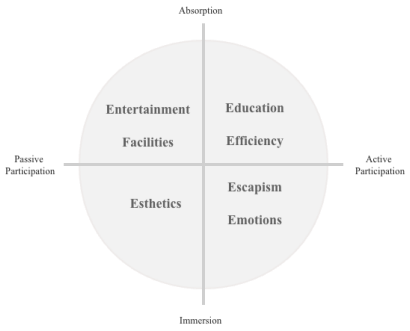

Figure 2. Components of the expanded Experience Economy Model

This research makes three significant contributions. Firstly, it expands Pine and Gilmore's Experience Economy Model (1998) to the area of customer experience in hotels with robot services, providing a comprehensive framework that reflects the unique characteristics of this field. Secondly, as hotels with robot services are a relatively new phenomenon in China, this study contributes to research on customer experience in the Chinese market, enabling the hotel industry to gain a better understanding of customer concerns and improve service quality. It also provides theoretical support for the application of service robots in other fields. Thirdly, this study combines inductive and deductive methods, assigning codes to the four traditional dimensions of the Experience Economy Model for inductive analysis and expanding three new dimensions, forming the 7E Model (as shown in Figure 2). This methodology provides valuable insights for related research fields.

5.3 Practical Implications

(1) Based on the findings, hotels should prioritize customers' needs for basic facilities and traditional services, using robot services as a complement.

(2) To enhance the efficiency and emotional experience of robot services, hotels can upgrade and optimize robot systems, improving voice recognition accuracy and adding social functions to robots.

(3) Pay attention to entertainment and educational experiences, such as robot interactive games, technology explanations, and performances.

(4) To meet customers' diverse visual needs, hotels can seek customer opinions on decoration design and overall style.

(5) While maintaining a quiet and orderly environment, hotels can also add cultural and artistic activities, like "flower arrangement," "concerts," and "book clubs," providing customers with an escape from their daily lives.

5.4 Limitations and Future Research

This study has some limitations. Firstly, the research sample only covers some hotels in Hangzhou that provide robot services. Future research can collect more research samples in other cities. Secondly, this study did not explore the mechanism of the impact of the "passive to active" and "immersion integration" dimensions in the experience economy model in depth. Future research can conduct more specific analysis of the allocation of dimensions in the quadrants to better guide management practices. Finally, this study lacks demographic statistical information on customers, limiting the applicability of the research results to segmented markets. Future research can compare different customer groups.

References

[1] Zhang Hongmei, Liang Changyong, Xu Jian. Innovation of the smart tourism cloud service system under the background of "tourism + internet". Tourism Tribune. 2016; 31(6):12–5.

[2] Tan Jun. Policy of robot industry and high-quality development of enterprises[D/OL]. Wuhan University, 2021.

[3] Wang Chengrong, Wang Chunjian. Reflections on the construction of a smart community commercial service system in the "post-Covid-19 era". Commercial Economic Research. 2020; (12):5–9.

[4] International Federation of Robotics. International Federation of Robotics [Internet]. IFR International Federation of Robotics. [cited 2023 May 12]. Available from: https://ifr.org

[5] Shin HH, Jeong M. Guests' perceptions of robot concierge and their adoption intentions. IJCHM. 2020 Jul 10; 32(8):2613–33.

[6] Fuentes-Moraleda L, Díaz-Pérez P, Orea-Giner A, Muñoz- Mazón A, Villace-Molinero T. Interaction between hotel service robots and humans: A hotel-specific Service Robot Acceptance Model (sRAM). Tourism Management Perspectives. 2020 Oct; 36:100751.

[7] Lee Y, Lee S, Kim DY. Exploring hotel guests' perceptions of using robot assistants. Tourism Management

Perspectives. 2021 Jan; 37:100781.
[8] Yu Xinxin. Customer attitude and willingness to reuse of hotel service robot [D/OL]. Dongbei University of Finance and Economics, 2019.
[9] Sun Lei. Influence factors of hotel service robot on customer satisfaction based on analytic hierarchy process. Journal of Wuhan Polytechnic College. 2022; 21(3):60–5.
[10] Pine BJ II, Gilmore HJ. Welcome to the Experience Economy. Harvard Business Review. 1998; 97–105.
[11] Quadri-Felitti D, Fiore AM. Experience economy constructs as a framework for understanding wine tourism. Journal of Vacation Marketing. 2012 Jan; 18(1):3–15.
[12] Liu Caixia, Li Daosheng. Research on the development of wine tourism industry from the perspective of consumer experience: taking Ningxia Hui Autonomous Region as an example. Journal of Jilin Education Institute. 2022; 38(6):162–5.
[13] Bao Y, Ma E, La L, Xu F, Huang L. Examining the Airbnb accommodation experience in Hangzhou through the lens of the Experience Economy Model. Journal of Vacation Marketing. 2022 Jan; 28(1):95–116.