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Priority? The Combination of Intelligent Services and Warm Services in Cross-Strait Hotel Service Delivery Processes

Purpose – Combining "intelligent" and "warm" services has become a new strategy for improving service touch-points and customer experiences. This research discusses how to appropriately integrate intelligent and warm services into service delivery processes to optimize the service touch-points within customer journeys and increase service values.

Design/methodology/approach – Top managers of 13 intelligent hotels were interviewed, 18,879 online customer reviews were compiled, and on-site observation and recordation was conducted.

Findings – Intelligent services cannot wholly resolve customer pain points, as key service touch-points require combining warm and intelligent services to increase service value.

Research limitations/implications – Follow-up research can adopt more quantitative surveys to obtain more reliable general results.

Practical implications/Social implications – The appropriate combination of intelligent and warm services within service delivery processes can help to improve customer experiences. The smart hotels on both sides of the strait have their respective strengths reflected in their business competitiveness.

Originality/Value – This research is a pioneer study that explores "intelligent services" and "warm services" from a theoretical perspective and can help improve service touch-points and foster customer journey experiences.

Keywords – Smart hotels, Intelligent services, Warm services, Customer journey, Service touch-points

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孰輕孰重？兩岸旅館溫度與智慧化服務研究

研究目的：「智慧化」與「有溫度服務」的結合已成為旅館改善服務接觸點與顧客體驗的新策略。本研究探討兩岸旅館如何將智慧化與有溫度的服務適時融入服務傳遞過程，優化顧客旅程中服務接觸點，提升服務價值。

研究方法/方法：訪談兩岸 13 家智慧化旅館高階經理人及蒐集 18,879 則顧客線上評論貼文，並實際入住觀察與紀錄。

研究結果：智慧化無法完全解決顧客痛點，應在主要的服務接觸點將有溫度服務與智慧化相結合，以提升服務價值。

研究限制/啟發：後續研究可導入更多量化調查，以獲得更可靠的通則結果。

理論/實務/社會意涵：智慧化與有溫度服務在服務傳遞過程中的良好結合可改善顧客體驗，兩岸智慧化旅館各有所長，反映在其經營競爭力上。

創見/價值：本文是理論上探究旅館「智慧化服務」與「有溫度服務」之先驅研究，可改善服務接觸點及較好的促進顧客旅程體驗。

關鍵字：智慧化旅館、智慧化服務、有溫度服務、顧客旅程、服務接觸點

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1. Preface

The adoption of digital technology and artificial intelligence by hotels has become increasingly prevalent, while the outbreak of COVID-19 at the beginning of 2020 further increased the significance of the application of smart technology by hotels. According to the "2019 China Smart Hotel Market Analysis Report", hotels in mainland China have quickly introduced intelligent services, with the market penetration rate increasing from 6.45% in 2014 to 19.12% in 2018. Indeed, it is expected that the integration of intelligent services by hotels will reach 35% by 2025 (Chinabaogao 2019). At the same time that new digital services, such as the Internet of Things, artificial intelligence, automated interfaces, and self-service technologies, are being incorporated into hotel service delivery processes, the service expectations of customers and the question of how to improve management effectiveness are becoming increasingly valued by hotel industry practitioners (Wu and Cheng 2018).

The question of how different service touch-points can balance intelligent and warm services to provide customers with consistently high-quality services, allowing them to experience hotel services of high value, is a predicament that many hotel practitioners have encountered in their service design process (Ivanov and Webster 2019; Peng and Zhang 2020). Additionally, many cases have shown that if smart facilities malfunction or the service design is not adequately efficient, this will result in a large amount of negative customer feedback. Bearing this mind, when incorporating smart technologies into service designs, it seems necessary to ask, what must be done so that customers can experience a combination of humanized and warm services?

Alongside the quick development of intelligent services, hotel-related research in the past which focused on the exploration of service encounters, service design, customer journeys, smart technologies, and services is seemingly unable to give a definitive answer as to how hotels can balance intelligent services and warm services at the different touch-points within customer journeys. Past research discovered the advantages and disadvantages and the critical role that technology plays in service encounters. Still, related literature has yet to explore the appropriate allocation of technology and warm services at each service touch-point during the service process. Because the hotel industry has a high amount of service encounters with customers, and although technology is widely utilized in the intelligent service encounters in hotels, no literature has explored solutions for how smart hotels can combine intelligent services with the customer experience enjoyed during warm services. Thus, rather than the fact that the service touch-points during the service process are bound to be different from traditional service models, the question of how to combine smart technologies and the warmth of human services to establish a more comprehensive service design is among the topics that this research wishes to discuss.

Service design research, as it presently exists, merely focuses on the important role that the utilization of technology plays in service processes while seldom researching or investigating the integration and classification of a service design that incorporates both technology and the warmth of human services at different touch-points. Especially because intelligent service designs for hotel service delivery processes need to be diverse, each touch-point, from when the customer arrives until when the customer leaves the hotel, is of the utmost importance. Although related research has used topics such as technology intervention, technology interaction, impact on service reviews, experience design, and self-service usage willingness as entry points for discussing service design and technology application (Fang and Hsu 2005; Ivanov 2019; Lin and Hsieh 2006; Meuter et al. 2000), as to how smart hotels can combine the convenience of technology with warm services at each service touch-point continues to suffer from a lack of academic theory and practical references. In terms of practical application, the question of how to provide a meaningful service design experience that allows customers to receive technical assistance and have meaningful interactions with customer service staff is a topic in urgent need of discussion.

This seemingly easy task of technology introduction and an approach that centers on design application has resulted in quite a few failures in today's hotel industry. For example, at the world's first unmanned hotel, Henn-na Hotel in Nagasaki prefecture in Kyushu, Japan, the first hotel to feature fully automated robotic services, the system's lack of fool-proof mechanisms and service recovery strategies, resulted in service errors at each service touch-point which were unable to be resolved immediately by robots, conversely leading to increased workloads for staff members (Shead 2019); the first hotel in Taiwan to adopt unmanned services, the Chase Walker Hotel, advertised intelligent services such as food delivery robots, a QR-code access control system, and luggage storage robots, but faced a multitude of customer complaints upon commencing business (Hsu 2019). Consequently, as seen in the above examples, when incorporating innovative technology into service design, the issue of how to provide customers with human and warm services is one that many practitioners must face.

In summary, related literature on hotel intelligent services has discussed the application of intelligent systems, service encounters and their importance (Hung 2001; Chahal and Kumar 2014; Chang and Yang 2008; Ivanov 2019; Peng and Zhang 2020). However, in terms of academic literature, there has yet to be any research that explores a service model that combines smart technology and warm services at each touch-point. Therefore, this research explores how hotels in the cross-strait region that offer intelligent services can appropriately incorporate warm services into the service delivery process to optimize the service touch-points within customer journeys to increase service value.

2. Literature Review

2.1 The Impact of Smart Technology on Hotel Service Encounters

The concept of service encounters was first introduced by scholars, including Solomon and refers to the influence that staff-customer interactions have on customers' recognition and assessment of service quality (Solomon et al. 1985). Subsequently, research from scholars pointed out that service encounters include the touch-points between customers and service providers, as well as interactions with the physical environment (Bitner 1990; Harris, Kim, and Baron 2003). When a customer is receiving any given service, such service encounters are a critical moment in the interaction process during which the manner that service staff members respond to the needs of the customer is a primary factor that influences customer satisfaction levels (Bitner, Booms, and Tetreault 1990; Grove and Fisk 1992). Furthermore, in physical settings, service encounters positively impact customer experience value (Wu and Liang 2009).

Relating to service encounters, past research has primarily discussed the topics of the physical environment, customer experience, and customer satisfaction and dissatisfaction (Bitner, Booms, and Tetreault 1990). Yet, relatively scarce research has discussed the subsequent application of technology in service delivery processes following the intervention of technology in service encounters. Meuter et al. (2000) conducted empirical research which used customer satisfaction as a pretext to explore the role that self-service technological services play in the service delivery process, finding that after the intervention of technology in service encounters, the satisfaction level, in terms of conservation of time and convenience of use, was higher than that of staff encounters; on the other hand, technological service errors or inadequate process designs lead to dissatisfaction during technological service touch-points. However, the above research only discussed the impact factors of technological contact regarding customer satisfaction during the service delivery process. Yan, Xiao, and Gong (2020) studied the cross-domain integrated development of the retail and hotel industries through the integration of mobile internet technology to observe the state of service encounters and service processes according to a new retail model, pointing out that the key service touch-points included physical touch-points, digital touch-points, and interpersonal touch-points; only through the combination of the above three points could the overall customer experience and satisfaction level be increased. However, although the research above discovered the advantages and disadvantages of technology and the importance of its role in service encounters, they did not appear to discuss and propose a strategy that incorporates both intelligent and warm services during the service encounter process.

Since the intervention of technology in service encounters, satisfaction was seen in the aspects of conservation of time and convenience of use (Fang and Hsu 2005; Meuter et al. 2000; Peng and Zhang 2020). However, factors such as technological service errors and inadequate process designs will result in customer dissatisfaction (Meuter et al. 2000). Especially in the case of Japan's Henn-na Hotel, due to machine malfunctions, intelligent services were unable to satisfy customer needs leading to the interruption of service processes during certain service touch-points, conversely leading to increased workloads for staff. Therefore, although the above discourses on service encounters understood that the interactions that customers have during the service encounter process would have a certain degree of impact on the customers' service experiences and feelings, no literature has yet presented a solution for how smart hotels can appropriately integrate technology and warm services at each service touch-point to serve as a practical strategic reference.

2.2 The Impact of Service Design on Smart Hotel Experience

Service design emphasizes the process of a customer's firsthand experience of services at a service venue and can deliver a series of unique experience designs to customers (Moggridge 2007; Zeithaml, Parasuraman, and Berry 1990). Service design includes instantaneous contact, while touch-points are the focal points of service systems. In addition to considering how to provide customers unique experiences at touch-points, service design should also pay due attention to a comprehensive range of feelings customers may have and understand how to allow customers to accurately perceive the value of the service delivery process at each stage regarding before, during, and after-service encounters (Zeithaml, Parasuraman, and Berry 1990). As such, some scholars regard service blueprints, service touch-points, service safaris, and customer journey maps as effective service design tools for integrating front- and back-of-house product services and set designs and establishing a system process design that delivers a total customer experience.

Technology integration into service design has garnered the attention of numerous scholars. Quite a sizable body of literature has focused on the topic of technology-based service design (Aurich, Fuchs, and DeVries 2004; Aurich, Fuchs, and Wagenknecht 2006; Montoya-Weiss, Voss, and Grewal 2003), while many scholars have also focused on its shortcomings. For example, to reduce the number and frequency of technological service errors, actual customer experiences must be integrated into the design of multi-channel services (Chang and Yang 2008). During the travel industry's service delivery process, intelligent robots can bring customers joy and create value, but they can also bring about service failures at service touch-points (Ivanov and Webster 2019). Although such integration of technology by smart hotels can reduce the time and labor involved in service processes, issues of sensitivity and reactivity toward customer needs still need to be resolved; therefore, hotel practitioners should focus more on the actual needs of customers (Peng and Zhang 2020). The above literature has discussed the importance of technological application in

service processes and how to increase opportunities for service touch-points, but as to how the convenience of technology can be combined with warm services at each hotel service touch-point, there remains a lack of academic theory and practical references. This research thus aims to tackle this topic.

2.3 The Impact of Customer Journey on Smart Hotel Service Experience

Customer journey refers to the interactions between a customer and service provider that occur at each touch-point which, in combination, form a series of service encounters (Bitner 1990, 1992). Each touch-point and interactive mode is thus a critical moment in the service process. Different service touch-point in series, when combined, make up different customer journeys, and these touch-points, critical moments, and key services are the primary aspects that impact the success or failure of a given service (Folstad and Kvale 2018; Halvorsrud, Kvale, and Følstad 2016; Lemon and Verhoef 2016).

In past research, many scholars have used customer journey maps as a service design tool for exploring the actual needs of, and management strategies regarding, customers (Chiu, Chen, and Mou 2017; Chang and Yang 2008; Lemon and Verhoef 2016). In terms of structural delineations, different perspectives have been used. The most representative of those takes a service marketing perspective, deconstructing customer journey maps into the three major categories and eight subcategories of before-service (public relations, social media, word-of-mouth marketing, past service experiences), service period (customer journeys), and after-service stages (customer relations management, social media, word-of-mouth communication) (Aurich, Fuchs, and Wagenknecht 2006); a second perspective is based on the purchase cycles of customers, believing that past purchase experiences influence each customer experience and future journey experience and designating the structural stages of customer journeys as the before, during, and after-purchase levels of experience (Lemon and Verhoef 2016). Stein and Ramesehan (2016) used the Disney Magic Band as an example to explain how innovative methods for introducing technology into traditional service ecosystems were used to strengthen Disney's service touch-points and create more meaningful customer experiences. The theme park used technology and the atmosphere of the physical environment to deliver to customers a seamless and customized service, creating memorable experiences at each service touch-point, and achieving unique and unexpected results during the post-consumption stage.

The findings of customer journey theory generally use customers as the vantage point, believing that the service experiences of customers during the interactions at each service touch-point will impact their total consumption experience from before to after receiving services (Stein and Rameshan 2016). However, scholarly research has yet to present comprehensive literature that discusses how customer journeys will evolve and the new characteristics of customer experiences following the incorporation of technology. Especially the touch-points within the customer journeys at smart hotels are diverse and complicated; the research of Chahal and Kumar (2014) pointed out that technology applications in hotels must be customer-oriented, provide friendly usage experiences, and enable different customer segments to receive value from technology usage; only then can customer experiences be created. There has also been copious literature that has focused on the feelings of customers at different levels of interaction (Verhoef et al. 2009), as well as the emotions, moods, and feelings or psychological-level responses produced under different service settings (Zomerdijk and Voss 2010). In actuality, the design of each service touch-point within customer journeys must consider the various psychological factors that influence customers. Therefore, when applying technological innovations, human services cannot be ignored (Wozniak et al. 2018). According to the current trend of integrating technology into the business management of hotels, customer journey maps are a diverse system with highly complex designs that contain a rich variety of services. Thus, the question of how hotels can combine intelligent technology and warm services at each service touch-point requires discussion from a diversity of perspectives to make up for the shortcomings of the aforementioned theories and practices.

2.4 The Importance of Smart Hotel Technology in Regards to Warm Services

There is relatively more literature available on the integration of technology by hotel operations. Early research endeavor has tended to focused on information technology product communications (Sigala 2003), technology usage, and hotel operating performance (Ham, Kim, and Jeoing 2005). However, in the past ten years, relatively more research has explored topics such as the operating cost of smart technology integration by smart hotels, total customer experience, problem and management effectiveness, the service delivery value of robots (Ivanov 2019), and the importance of service processes and service quality (Peng and Zhang 2020).

Although research on the integration of intelligent technology by hotels has increased with each passing year and scholars have performed analyses derived from a variety of theories and perspectives, the majority have been confined to the discussion of intelligent system applications, service encounters, and their importance (Chahal and Kumar 2014; Halvorsrud, Kvale, and Følstad 2016; Ivanov 2019; Peng and Zhang 2020). Indeed, there is still lack of academic research on how intelligent technology can be combined with warm services at each touch-point in the hotel service process. In terms of practical application, although many hotels have begun to invest in smart technology, there remains room for improvement in regard to the aspect of service process design, while the further discussion is needed on how to harmoniously combine smart technologies and human services at key touch-points. In summary of the above, there still exist shortcomings in research in regard to the hotel service designs for "intelligent" and "warm" services. To

address this point, this research has used the customer journeys of Stickdorn and Schneider (2012) and Lemon and Verhoef (2016) as a starting point and conducted in-depth interviews to systematically study the different service touch-points of the hotel in the cross-strait region in terms of "intelligent" and "warm" service designs. In addition, the researchers performed on-site observation at cross-strait hotels and content analysis was used to summarize the customer reviews regarding smart hotels on the travel sites TripAdvisor and Ctrip, thereby constructing a comprehensive service design blueprint with academic and practical implications.

3. Research Methods

3.1 Research Design

In terms of its approach, this case study adopted a qualitative research methodology, and purposive sampling was used to select the research participants. While collecting first-hand data, researchers stayed on-site at 13 cross-strait hotels to observe and experience hotel service processes and were also accompanied by a high-level manager of each hotel when entering the research sites and carrying out the observation of the various facilities. Lastly, in-depth interviews were administered in a semi-structured format to learn about how hotel practitioners applied smart technology to customer journeys and hotel service processes to aid the study of hotel practitioners' implementation of service processes. This research was a multiple-case study, and the researchers also collected documents, records, and observation data to improve the research quality.

In terms of the analysis of online reviews, analysis was conducted on the customer reviews of case hotels which appeared on the two travel websites TripAdvisor and Ctrip to understand the feelings of customers at each service touch-point. Through the analysis of customer perception, the goal was to examine the implementation statuses and effectiveness of smart hotel service processes. Regarding the actual data collection, two experts were first asked to assess keywords related to service processes and to delete unnecessary keywords and combine similar keywords, or to revise certain terms. Next, an analysis was conducted on smart hotel reviews taken from the world's biggest travel website TripAdvisor and Mainland China's biggest travel website Ctrip to investigate consumers' feelings regarding each service process.

3.2 Research Participants

As of January 1, 2020, Mainland China had a total of 608 thousand lodging establishments which offered a total of 18.917 million guest rooms (China Hospitality Association 2020). During the same period, Taiwan had 25.9 thousand lodging facilities and a total of 367 thousand guest rooms (Taiwanstay 2020). Amid the flourishing development of the hotel industry on both sides of the strait, in order to ensure that the most representative research participants were chosen, in addition to successive introductions by way of the interviewees, alongside the purposive sampling method this research also used several criteria as its basis of selection: those that were famous chain brands with establishments in major cities on both sides of the strait; those which journal articles had named as models for smart hotels; those who have shown outstanding innovation and business performances; those that were brands of listed companies; or those with the greatest market shares. In addition, to ensure the representativeness of research participants and increase research quality, it was required that international and domestic brands alike had incorporated comprehensive intelligent systems and had an understanding of actual smart hotel operations. Based on the above principles, this research selected 13 hotels in Taipei, Taichung, Shanghai, Hangzhou, and Fuzhou for the administration of on-site surveys as well as the interviews of high-level managers. Among the interviewees from the 13 hotels, because hotels H and I belonged to brands of the same group, only one high-level director was interviewed; the same holds for hotels J and K. As a result, there were 11 interviewees. In addition to in-depth interviews, this research also conducted online review analysis for the 13 hotels.

3.3 Research Methods

3.3.1 Analysis of Online Reviews

Online reviews significantly impact on consumers' online reservation willingness (Zhao et al. 2015). They also provide hotel businesses with valuable information, and whether the reviews are good or bad reflect the customer experiences and reputation management of the hotel. This research used the perspectives of Stickdorn and Schneider (2012) and Lemon and Verhoef (2016) to divide customer journeys into the four stages of before arrival, during arrival, lodging, and departure. At the same time, the research results of Bitner (1992); Stein and Rameseshan (2016) were used as a basis, where key services from the research results that correlate with the four services processes of customer journeys were taken and used as keywords. Next, two experts (each with 20 years in senior positions, and 9 years of experience as hotel guest managers) devised keywords relating to the intelligent services of hotels based on the actual lodging conditions of customers during the four service processes to determine the customer journey-based variables to be used for online review analysis. After discussion between the experts and researchers, the specific contents of service processes were determined to include the related customer review keywords for the four stages of before arrival, during arrival, lodging, and departure. Next, the smart hotel reviews on the world's biggest travel website TripAdvisor and Mainland China's biggest travel website Ctrip were analyzed to explore the feelings of customers in regard to each

touch-point within customer journeys.

3.3.2 Design, Data Processing, and Analysis of In-Depth Interviews

This research invited three high-level managers with over 20 years of experience working at hotels to serve as experts to perform the validity testing and language revision of the interview outline; doing so ensured that the interview outline was suitable to be used in the interviewing of research participants.

In terms of the data processing and analysis of in-depth interviews, this research used a semi-structured interview outline, and interviews were audio-recorded in their entirety. Transcripts were transcribed verbatim from the audio-recorded interviews and interviewees were asked to member check the contents. The analysis method used was content analysis since it can systematically and objectively compress and code-categorize large amounts of text, is able to elucidate the messages hidden within contents, helps to explore and describe key events, and is used to assess effective tools for trend and pattern development (Stemler 2000). Such an analysis method involves a process of simplifying data through systematic categorization and is primarily used in transcript or observation record analysis. The analysis process generally consists of the following processes: defining units of analysis, coding and categorization by experts, validity and reliability testing—where only when the reliability value between the assessors that reaches 80% is the data included in analysis and discussion, and lastly, the summary of conclusions and proposal of recommendations (Kassarjian 1977).

In order to avoid being affected by the personal ways of thinking, frameworks, and subjectivity of researchers, qualitative research often seeks out and appoints professionals with abundant experience in their chosen industry who have received proper academic training and are familiar with content analysis as authoritative judges to ensure research quality and scientific validity. On the other hand, researchers should take part in the entire process of data processing and analysis, during which, if there are differences in opinion or uncertainties among judges with transcript contents, the researchers should take on the role of mediator or interpreter as appropriate.

In summary of the above, in order to increase the quality of the research, the rigorous method of content analysis was adopted to analyze the data collected from in-depth interviews. Next, the specific steps are explained: the first step was to confirm the interview outline; the second step was to confirm that the content analysis process consisted of defining the units of analysis, code categorization, and validity and reliability testing; the third step was to create transcripts of the interviews; the fourth step was to ask the interviewee members to check the transcript contents by email; the fifth step was to ensure that the experts assume the role of judge and highlight key sentences or phrases in the transcripts, and to make sure the researchers to create units of analysis "cards"; the sixth step entailed the first coding of the units of analysis cards performed by the researchers in order to later track the sources of units of analysis; the seventh step involved categorization development and reliability testing. Judges A and B then categorized the cards based on their properties, assigned each categorization a name, and also confirmed the number of valid cards. After determining the topics for each categorization, judges A, B, and C performed a total of two reliability tests which, if passed, meant that the categorizations were confirmed. The specific procedure was to distribute the cards and ask expert C to reclassify the cards to measure interjudge reliability and then ask experts A and B to distribute and reclassify the cards again to assess intrajudge reliability; the eighth step entailed the second coding of units of analysis, and the ninth step was the construction of grounded models (see Figure 1 for details).
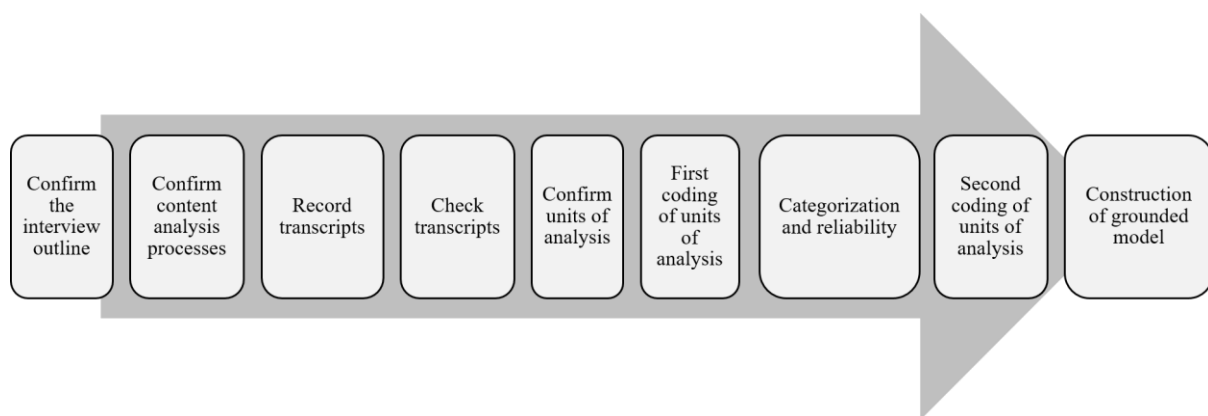

Figure 1   Flow Chart for Units of Data Analysis and Categorization Development

4. Research Results

4.1 Interview Content Analysis

4.1.1 Units of Analysis, Coding, and Categorization Development

This research conducted semi-structured interviews with the top managers of 13 cross-strait hotels; all recorded as transcripts with a total of 75,728 words. During the process of data analysis, the first step involved confirming the units of analysis. Judges A and B examined the transcripts, after which the 265 original units were summarized and coded, and cards were made for summary and analysis. The two judges then held discussions with the research team, after which 24 relatively unclear units of analysis were eliminated. Lastly, when summarizing the original units for the 3rd and 6th question items, it was discovered that interviewees often spoke of the reasons for the incorporation of intelligent systems. Therefore, after discussion with the two experts, these 7 units of analysis were transferred to the 1st question item. In the end, the resulting units of analysis included 69 involving the thinking direction aspect, 28 on before arrival, 46 on during arrival, 33 on lodging, 15 on departure, and 50 on future directions, making a total of 241 units of analysis cards (see Table 1).

Table 1   Categorization of Units of Analysis

Question Item	Aspect	Original Units	Eliminated Units	Adjusted Units	Final Units
1	Thinking directions	66	-4	+7	69
2	Before arrival	29	-1	–	28
3	Arrival	54	-3	-5	46
4	Lodging	42	-9	–	33
5	Departure	17	-2	–	15
6	Future directions	57	-5	-2	50
	Total Units	265	24		241

Next, from among the three experts, judge C was chosen to recategorize the cards to test interjudge reliability; two weeks later, judges A and B were then asked to disperse the cards and categorize them one more time. The reliability value obtained had to be 80 or above in order for the data to be suitable use in subsequent results analysis (Kassarjian 1977). The reliability value obtained by this research by means of interjudge and intrajudge was over 0.8, confirming that the categorization was reliable.

This research implemented two rigorous coding processes. During the first round of coding, the judges indicated key sentences or phrases from the transcripts which were then made into units of analysis "cards". Next, the researchers performed the first unit coding of the cards, so that the codes served as a reference as to which expert each "card" came from, as well as to the hotel business, question item, and key sentence or phrase correlating to each card—in other words, the "unit of analysis". The second coding took place after the three experts (judges A, B, and C) confirmed the categorization of the analysis cards, with the purpose being to recode the already categorized cards so that they matched their categorization topic. Following the two coding processes, the final coding specification for this research was as follows. Using 1A-2-3-2-A-1 as an example, the first three codes are the unit codes the experts gathered from reading the transcripts, with 1A-2-3 referring to expert 1, hotel A, and the 2nd question item and 3rd unit of analysis. The next three codes were then the unit codes after content categorization by experts, with 2-A-1 referring to question item 2, topic A, and unit of analysis 1.

4.1.2 Grounded Models for Hotel Intelligent Services

The grounded models proposed by this research hope to clarify three questions. The first question seeking to be resolved involves the reasons for the incorporation of intelligent services; the second is to ascertain how intelligent and warm services can be incorporated into customer journey maps; and the third attempts to define the future development directions for hotel intelligent services. The detailed results are shown below:

A.   Reasons for the incorporation of intelligent services

The interviewees named seven reasons for the incorporation of intelligent services; those reasons were sequentially efficiency, trend, differentiation, technology, brand DNA, big data, and human perspective (see Table 2). Among

them, efficiency was the most frequently mentioned reason (23/69, 33.33%). The interviewees believed that intelligent processes could reduce staff expenditure, in turn reducing cost and increasing operating efficiency. As mentioned by one interviewee: "*the efficiency of internal management has increased* (1L-1-8-1-D-13)". More importantly, efficiency increases can also optimize service processes and improve the service quality of human services. One interviewee stated that "*Through smart tools, we have improved back-end efficiency and the efficiency of hotel-customer interactions, optimizing the experience process as a whole* (1H1-1-5-1-D-11)".

Table 2   Reasons for the Incorporation of Intelligent Services

Category	Topic	Number of Cards	Percentage
A	Technology	8	11.59%
B	Trend	15	21.74%
C	Human perspective	3	4.35%
D	Efficiency	23	33.33%
E	Big data	3	4.35%
F	Brand DNA	6	8.70%
G	Differentiation	11	15.94%
	Total Units	69	

Note: (O) refers to units of analysis that were categorized correctly; (X) refers to units of analysis that were categorized incorrectly. Intrajudge for judges A and B: trend: (15(O)-1(X))/15 = 93.33%; the intrajudge for all other categories was 100%.Interjudge determined by judge C: trend: (15(O)-1(X))/15 = 93.33%; efficiency: (23(O)-1(X))/23 = 95.65%; the interjudge for all other categories was 100%.

B. How to incorporate intelligent and warm services into customer journey maps

The intelligent and warm services at each touch-point within customer journeys can be divided into the four stages of before arrival, arrival, lodging, and departure.

The category topics for before arrival were pre-arrival housekeeper, customer relations, smart facilities, and digital app (see Table 3). While providing intelligent services that are at once high-tech and convenient, hotel practitioners did not neglect warm services; after all, whether through staff interaction or smart devices, it is always hoped that customers can be given the best possible experience. The most frequently mentioned topic was the pre-arrival housekeeper (11/28, 39.29%). Interviewees expressed that whether by remote services such as telephone, email, WeChat, Facebook, or deigital app, the supplementation of friendly conversation and dialogue is essential. For example, whether in interactions with customers via telephone, the dialogue used for room reservation services, or friendly interactions with customers via WeChat, email, Facebook, or digital app, the provision of the aforementioned customized services allows the customer to feel warmth. For example, an interviewee mentioned, "*We have a customized response as to the tone to use when replying to customers* (1A-2-1-2-D-1)"; another interviewee stated, "*Managing Facebook pages allows us to connect and interact with our loyal and potential customers. From the moment when the customer makes a reservation online to their actual on-site lodging experience, the aim of all service personnel is to provide consistent and timely customer services* (1C-2-2-2-D-4)."

The "during arrival" stage consisted of six topics which included instant impression, self-check-in, cross-strait differences, lodging guide, big data, and digital app (See Table 4). During this touch-point when the customer arrives at the hotel, in addition to intelligent technological services such as self-check-in and digital app, hotel practitioners must deliver warm services in order to give the customer an instantly favorable impression. As to how to at this service touch-point allow customers to experience both the convenience of technology and warmth of services, the focus or balance is decided on the basis of the positions and value propositions of the hotels themselves. This research discovered that Taiwanese hotels tended to value warm services, whereas Mainland Chinese hotels invest relatively more in smart equipment. In summary, it was found that it is important to give the customer a good impression upon arrival. If the customer finds the service to be a pleasant experience, if connections are formed with the customer, and if the service is considerate and thoughtful and replete with attentive gestures and warm smiles, customers are more likely to have deeper and more positive impressions based on such services that, besides adopting smart equipment, are characterized by professional knowledge and intimacy (27/46, 58.70%). For example, an interviewee said, "*Our four core spirits of surprising, connecting, touching, and real* (2A-3-1-3-E-19)"; another stated that "*Connecting is to find ways to establish*

connections with customers, 'touching' is to be moved, and for 'real', what's most important is to present yourself authentically (1A-3-3-3-E-3)"; and yet another quote was, "In addition to unmanned intelligent service systems, we have personnel at the front desk who can assist customers in case they have any questions (2C-3-1-3-E-23)".

Table 3   Grounded Model for Intelligent and Warm Services Before Customer Arrival

Category	Topic	Number of Cards	Percentage
A	Intelligent equipment	6	21.43%
B	APP	3	10.71%
C	Customer relations	8	28.57%
D	Pre-arrival housekeeper	11	39.29%
	Total Units	28	

Note: (O) refers to units of analysis that were categorized correctly; (X) refers to units of analysis that were categorized incorrectly. Intrajudge for judges A and B: trend: (11(O)-1(X))/11 = 90.91%; the intrajudge for all other categories was 100%. Interjudge determined by judge C: trend: (8(O)-1(X))/8 = 87.50%; the interjudge for all other categories was 100%.

Table 4   Grounded Model for Intelligent Services and Warm Services During Customer Arrival

Categorization	Topic	Number of Cards	Percentage
A	Lodging guide	3	6.52%
B	APP	3	6.52%
C	Self check-in	5	10.87%
D	Big data	3	6.52%
E	Instant impression	27	58.70%
F	Cross-stait differences	5	10.87%
	Total Units	46	

Note: Intrajudge for judges A and B: intrajudge = 100% for all categories. Interjudge determined by judge C: interjudge = 100% for all categories.

The five categories for lodging were cross-strait differences, handy telephone, interaction system, high-speed internet, and electric vehicle charging station (see Table 5). This research found that, due to the hope that customers could enjoy convenient services during the lodging period, smart devices were highly valued by hotel practitioners, and that these services could in turn increase warmth. When incorporating intelligent services, the balance between those and of warm services is manifested most concretely in the design of guest rooms. For example, in one 20 square-meter room, one practitioner installed 9 three-prong outlets, 9 two-prong outlets, and 2 USB interfaces, and taking modern people's reliance on technology into consideration, even meticulously installed a charging outlet on the sofa. Such a design not only makes full use of intelligent services but adds warmth to resolve pain points in the customer journey (insufficient charging outlets in rooms). Such an aspect is also reflected in cross-strait differences, where Mainland China offers greater diversity in its application of smart equipment and devices; instance of this include mobile door keys, cell phone control of room facilities, unmanned luggage machines, facial identity scanners. One quote summed this point up: "*The electric control system in our guest rooms does not use the traditional method of remote control or button panels to adjust the curtains, lighting, television, air conditioning, or other equipment. Guests can directly control them wirelessly through their cell phones (2F-4-1-4-E-10)*".

Table 5   Grounded Model for Intelligent Services and Warm Services During Lodging

Categorization	Topic	Number of Cards	Percentage
A	Interaction system	4	12.12%
B	High-speed internet	3	9.09%
C	handy phone	8	24.24%
D	Electric vehicle charging station	3	9.09%
E	Cross-strait differences	15	45.45%
	Total Units	33	

Note: (O) refers to units of analysis that were categorized correctly; (X) refers to units of analysis that were categorized incorrectly. Intrajudge for judges A and B: trend: (15(O)-1(X))/15 = 93.33%; the intrajudge for all other categories was 100%. Interjudge determined by judge C: interjudge = 100% for all categories.

Lastly, the five categories for customer departure were continued impressions, cross-strait differences, thank you letter, customer feedback, and smart equipment defects (see Table 6). In addition to smart equipment, customers wished to feel the warmth of personnel services, and good experiences tended to increase their loyalty to the brand. In terms of making continuing impressions during the customer departure stage, an interviewee mentioned how a first-time customer was converted to a loyal customer: "*During the month of December, we prepared soup for him and advised him on the weather changes. He said that he had to return to the United States for Christmas but would return to stay in our hotel. He has now stayed for a hundred room nights (2L-5-2-5-C-5)*". The specially interesting aspect which this scenario highlights is that Mainland China hotels can provide services such as digital app direct check-out, mobile self-payment, and self-invoicing through QR code scan, while such technological services, in turn, provide customers with warm services such as greater privacy and security, a more convenient payment method (especially since during times of the Covid-19 epidemic, customers are less willing to pay via credit card or cash due to considerations of sanitation), and faster payment processing, while Taiwan seldom provides these services.

Table 6   Grounded Table for Intelligent Services and Warm Services During Customer Departure

Category	Topic	Number of Cards	Percentage
A	Thank you letter	2	13.33%
B	Defects in smart equipment	2	13.33%
C	Continued impressions	5	33.33%
D	Customer feedback	2	13.33%
E	Cross-strait differences	4	26.67%
	Total Units	15	

Note: (O) refers to units of analysis that were categorized correctly; (X) refers to units of analysis that were categorized incorrectly. Intrajudge for judges A and B: continued impressions: (5(O)-1(X))/5 =80%; the intrajudge for all other categories was 100%. Interjudge determined by judge C: interjudge = 100% for all categories.

C. Future development directions for hotel intelligent services

The ten categories for the future development of hotel intelligent services were service upgrade, big data, collection of customer data, intelligent service incorporation, business aspect, market aspect, cost consideration, return customers, member database, and cross-strait differences (see Table 7). It is thus seen that practitioners hope to achieve a synergy between the objectives of increasing the operating efficiency of hotels through intelligent service incorporation, achieving the automation of business procedures to induce service upgrades, obtaining and analyzing data to provide customers with more balanced services, and increasing interactions between customers and staff in order to satisfy the

actual needs of customers. As mentioned by one interviewee: "Upgrade customer services in keeping with the habits of customers (1A-6-2-6-E-1)".

Table 7   Grounded Model for the Future Development Directions for Hotel Intelligent Services

Category	Topic	Number of Cards	Percentage
A	Collect customer data	6	12.00%
B	Member database	2	4.00%
C	Big data	8	16.00%
D	Return customers	3	6.00%
E	Service upgrade	14	28.00%
F	Cost considerations	3	6.00%
G	Intelligent service incorporation	5	10.00%
H	Business aspect	5	10.00%
I	Market aspect	3	6.00%
J	Cross-stait differences	1	2.00%
	Total Units	50	

Note: Intrajudge for judges A and B: intrajudge = 100% for all categories. Interjudge determined by judge C: interjudge = 100% for all categories.

4.1.3 Comparison of Cross Strait Interview Analysis

In the data analysis, the researchers and experts found differences in the responses of cross-strait hotels for the third, fourth, fifth, and six questions. A common phenomenon was that mainland Chinese hotels already owned smart facilities (a point that was not mentioned in Taiwan interviews), while the contents of interviews conducted in Taiwan were frequently also mentioned in the mainland China interviews. The cross-strait differences were subsequently compiled in Table 8 and focus on contents that were mentioned in the mainland Chinese interviews but were not mentioned in the Taiwanese interviews. Cross-strait differences are also introduced in detail in accordance with the topics of "Grounded Models for hotel intelligent services".

Table 8   Cross-strait Comparison Table

Question Item	Number of Cards	Cross strait differences - content that was only mentioned in Mainland China interviews
3. Before arrival	5	● Unmanned luggage machines (luggage delivery, food delivery, automatic elevators) ● Public safety requirements (ID scan, face-to-face confirmation) ● Face recognition check-in (ID scan is also required)
4. Lodging	15	● Room entry via mobile phone or directly entering password ● Bind official account members via mobile phone and then use phone to adjust room facilities

		●	VR experiences in rooms and provision of esports games in public spaces
		●	Currently actively implementing cultural training
5. Departure	4	●	Check-out directly via APP
		●	Scan QR code to generate invoice
		●	Scan QR code to follow hotel
6. How must customer databases be utilized to develop future plans? How to further integrate the development of intelligent services?	1	●	The installation of 5G networks in first and second-tier cities in Mainland China has been completed.

4.2 Online Word of Mouth Analysis

4.2.1 Collection of Review Data

Taking into account the differences in consumer habits on both sides of the strait, this research used the two online platforms, TripAdvisor and Ctrip, for gathering online reviews for the 13 case hotels. Because hotels in mainland China seldom use TripAdvisor, this research also included Ctrip and Booking.com in its analysis. At the time of the conclusion of the data collection period, the online word-of-mouth reviews for this research's 13 hotels numbered 18,879.

Because there are relatively few TripAdvisor reviews of hotels in mainland China, this specific platform was used by this research primarily to analyze the general information and online word-of-mouth reviews of Taiwanese hotels. Meanwhile Ctrip, aside from hotel G having not opened for business and, as a consequence, having no customer reviews, contained a considerable number of reviews for all other hotels. Thus, this research used Ctrip as the analysis tool to access general information and word-of-mouth content relating to the 12 "cross-strait" hotels. Additionally, Booking.com was originally used in order to establish a standardized tool of analysis. However, it was discovered that hotels in mainland China mainly use Ctrip for reviews, with many hotels having zero hotels on Booking.com (interviewee hotels H, I, J, K, and M). As a result, Booking.com was discarded as an analysis tool.

The online word-of-mouth analysis diagram is shown below. The online word-of-mouth reviews of TripAdvisor and Ctrip are analyzed next.
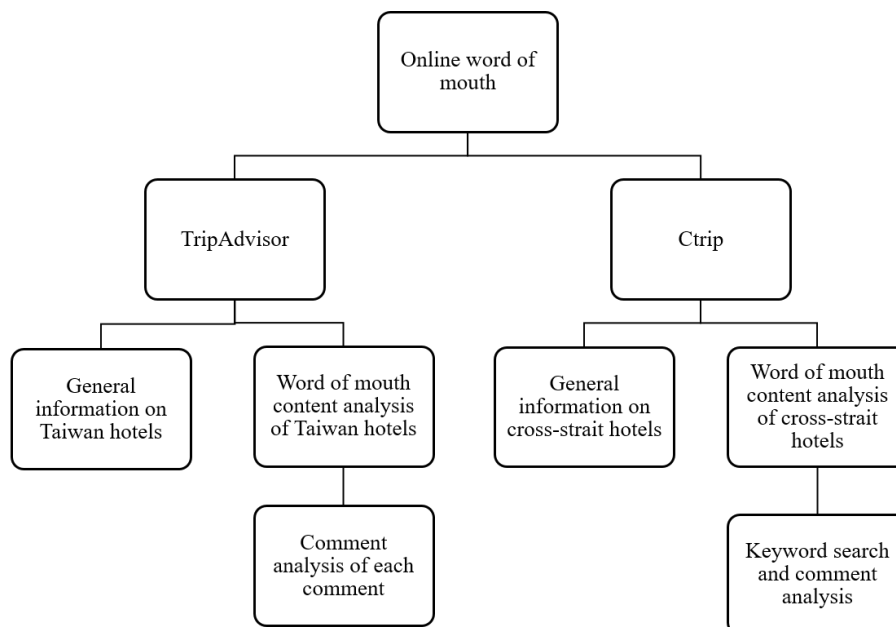

Figure 2　Online Word of Mouth Analysis Diagram

4.2.2 Online Word of Mouth-Content Analysis of TripAdvisor Online Reviews for Taiwan Hotels

Singh and Pandya (1991) divided word-of-mouth content into the two types of "positive word of mouth" and "negative word of mouth". Kim and Gupta (2012) perceived instances of word-of-mouth content that are positive affirmations to be positive word of mouth and complaints regarding negative experiences to be negative word of mouth. d'Astous and Touil (1999) expressed the opinion that consensus is the most impactful external cue. Whether by means of positive or negative reviews, the higher the degree of consensus, the greater the degree of trust evoked in readers. When potential hotel customers can perceive the tendencies of online reviews, this consistency in viewpoints increases their trust. According to information integration theory, when an individual receives, interprets, evaluates, and integrates experience messages and existing beliefs or attitudes, this informs and changes both beliefs and attitudes (Anderson 1981). Potential customers place more value on customer reviews than on professional reviews, while customer reviews, in turn, impact their choices and subsequent evaluation (Tsao 2014).

The number of online reviews on TripAdvisor for the 5 cases Taiwan hotels ranged from 152 to 1,864. Content analysis was conducted on all the online reviews of the five hotels, including the analysis of positive customer perceptions, such as the positive mood words of excellent, great, convenient, useful, comfortable, spacious, like, friendly, cordial, and attentive, as well as negative customer perceptions, such as the negative mood words of poor, awful, inconvenient, unfriendly, and disappointing. Thus, the contents of the online reviews reflected the positive and negative feelings produced in each customer journey.

Regarding customer reviews for each service touch-point, the "use of room facilities" during the lodging period was the most commonly mentioned in both positive and negative reviews. A considerable number of reviews spoke of feelings of curiosity and convenience about smart equipment; however, instances of inconvenience were also mentioned. Thus, the importance of hotel facilities cannot be ignored. When incorporating intelligent services, practitioners must think about how to maintain the balance of warm services. Using the topic of charging as an example, it was found that a reasonable number of charging outlets must be provided for customers during the lodging period, illustrating the importance of using greater warmth to resolve the pain points that customers meet during customer journeys.

Secondarily, "assistance of service staff" during the lodging period was also mentioned somewhat frequently, with many reviews speaking of the enthusiastic and cordial services of hotel staff. Additionally, the frequency of mention of "transportation access" was also relatively high. Because the location and access to transportation of a hotel are issues of considerable importance, the appropriate use of digital apps by smart hotels can increase the warmth of services. For instance, the shuttle bus appointment functions on hotel digital apps are an example of a considerate service, while shuttle bus timetables and estimated shuttle bus arrival times provide customers with considerable convenience. On the other hand, the transportation information on digital apps can provide customers with convenient methods for arriving at nearby tourist attractions. Such intelligent services thus serve to increase the service warmth of hotels.

Overall, the customers' reviews included their remarks on their experiences in regard to the merging of service and smart equipment, as well as room facilities and overall service processes. One customer said that even if the entity greeting them at the door was a robot, they could still feel its friendliness. At the same time, from the body of reviews made relating to self-service systems, service personnel, and room control systems, it can be seen that personnel were able to maintain service warmth in the provision of intelligent services, as in, for example, assisting customers in using self-service systems and providing customer care.

Examples of online word-of-mouth reviews that are related to the combination of intelligent services and the warm services of personnel are presented below:

A customer remarked that even if the entity greeting them at the door is a robot, they could still feel the friendliness of staff members.
A customer relayed their experience with the merging of service and smart equipment, as well as room facilities and overall service processes.
The reviews of customers in regard to self-service systems, service personnel, room control systems showed that personnel were able to maintain service warmth in the provision of intelligent services. An example of this was in assisting customers in using self-service systems and providing customer care.
The review mentioned the convenience of handy phones, such as for ordering food and making telephone calls, as well as the warm services provided by service personnel.
Issues of smart equipment malfunctions were mentioned, highlighting the important role played by service personnel.

4.2.3 Online Word of Mouth-Content Analysis of Ctrip Online Reviews for Cross-Strait Hotels

The number of online reviews on Ctrip for the 5 Taiwanese hotels A, B, C, D, E ranged from 52 to 1,730, and the most common aspects raised in the ratings were, from high to low, sanitation (4.70), location (4.62), service (4.62), and facilities (4.58). At the same time, the reviewing customers were considerably willing to recommend these hotels to

family members and other users. The number of online reviews for the 7 mainland Chinese hotels F, H, I, J, K, L, M on Ctrip ranged from 65 to 6,063 (hotel G was not open for business during the time of data collection and is, thus, not included in this discussion), and the most common aspect s raised in the ratings were, from high to low, sanitation (4.78), service (4.75), facilities (4.73), and location (4.72). The reviewing customers were also very willing to recommend the hotels to friends and family members and other users, and the scores were, on the whole, higher than those recorded for the 5 Taiwanese hotels.

Content analysis was performed following the filtering and selection of case hotel customer reviews. Below are examples of reviews that are related to the combination of smart facilities and warm services:

> *A customer mentioned the use of self-service systems, their experiences with guest rooms and public spaces, and the considerate arrangement of mealtimes.*
> *The enthusiasm of hotel staff and the intelligence experience at the hotel was remarked upon.*
> *A review introduced the room key navigation system and mentioned the experience of humanized facilities.*
> *A review described the experience of smart facilities via mobile phone and the service attitudes of staff.*
> *A review mentioned that the hotel provided VR and other smart facilities and the service of the staff was enthusiastic.*
> *A customer mentioned the use of smart speakers and the warmth of service personnel.*
> *A customer mentioned the hotel's incorporation of intelligent services as well as the attentive services provided by the front desk.*

From the above analysis of the reviews of cross-strait hotels, that customers gave considerably positive reviews for the case hotels. Smart facilities such as room key navigation systems, mobile phone control systems, VR, technology experience products and shopping provided customers with considerable convenience and novelty. More importantly, while providing these smart technologies, service personnel did not forget to provide appropriate care and assistance. Many reviews mentioned the enthusiasm of hotel service personnel, stating that staff would take the initiative to assist customers in operating self-service systems. Owing to the hotels use of a balanced service model that allows for the coexistence of smart technologies and warm services, the reviews given were exceptional.

5. Research Conclusions and Recommendations

The incorporation of intelligent services by hotels has become a popular trend, while the question of how to balance intelligent and warm services to give customers good experiences has become a topic of high concern in the industry. Based on the first-hand data obtained by this research through interviews of the top managers of cross-strait hotels and on-site investigation at case hotels and the analysis of online customer reviews, this research presents the following conclusions and recommendations:

5.1 Research Conclusions

5.1.1 Strategy Development for Combining Intelligent and Warm Services

Amid the rapid development of technology, smart hotels have become an inevitable trend. Smart development has taken a people-based approach as its starting point. Interviewee C mentioned that intelligent services are a new trend; through smart equipment, hotels can now provide customers with faster and more convenient services, which also actively satisfies consumer habits, such as that of smartphone usage. On the other hand, the warm services provided by smart hotel staff help to build favorable customer interactions and exhibit the value propositions of hotels. In order to deliver memorable customer experiences, hotel practitioners must be attentive to the aspects of environmental spaces, food quality, greetings, smiles, expressions, social courtesies, language, professional capabilities, safety, trust, and the provision of appropriate help when needed.

Two key factors, smart facilities and services with warmth, will play a major role in the future business operations of smart hotels. While pursuing streamlined processes characterized by speed and convenience, on the other end of the scale are the equally important and indispensable factors of attentive services and memorable experiences. As shown in Table 3, only with a strategy development that takes into account management efficiency and service quality can hotel practitioners provide customers with services that are convenient and satisfy customer needs.

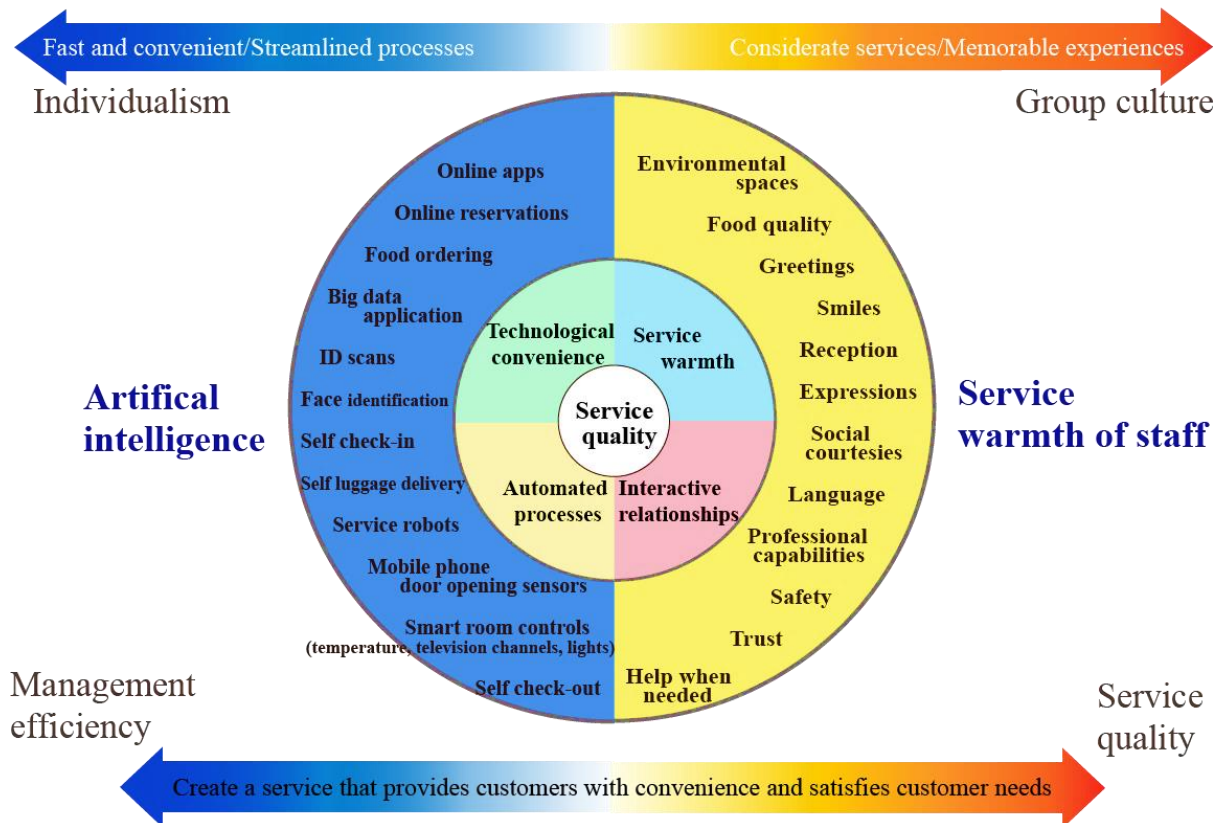# Strategy Development Diagram for AI and Service Warmth

Figure 3   Strategy Development for Intelligent and Warm Services

5.1.2 Create Irreplaceable Warm Services at Each Service Touch-point by Using Each Service Touch-point as A Basis

Compared to the individualistic culture in Western society, Asian ethnic groups place greater value on group culture and depend on human-to-human interactions. This research also verified that, relating to hotels, although intelligent services are very important, providing warm services and creating good customer experiences remain an important value proposition. By creating value-added experiences through memorable services, "human-to-human interaction" is an important factor influencing the service industry's development. When practitioners provide customers with considerate services, this leaves lasting memories in the minds of consumers. It can also be seen from the contents of the online review pages that customers felt and greatly appreciated the warm services of hotel practitioners, along with the smiles, friendly expressions, and cordial greetings of staff at each service point within their customer journeys, which added greater warmth to services.

5.1.3 Further Optimization of the Services at Each Service Touch-Point of Customer Journeys

Smart technologies can increase management efficiency and optimize service processes, while warm services can effectively increase the value of hotel-customer interactions, a conclusion that confirms the importance of the coexistence of intelligent and smart services and also aligns with the discourses from past research (Ivanov and Webster 2019; Peng and Zhang 2020; Tsao 2014). This research also verified the importance of each service touch-point within customer journeys. The actions of staff and their interactions with customers are a crucial medium for hotels to transmit service value, while they also greatly affect the actual perception customers have, and overall evaluation that they make, regarding hotels. After clarifying the intelligent and humanized services that exist at each service touch-point within hotel customer journey maps, in order to meet the objective of providing customers with both technological convenience and warm services, this research constructed a hotel customer journey maps that can be seen below (see Figure 4).
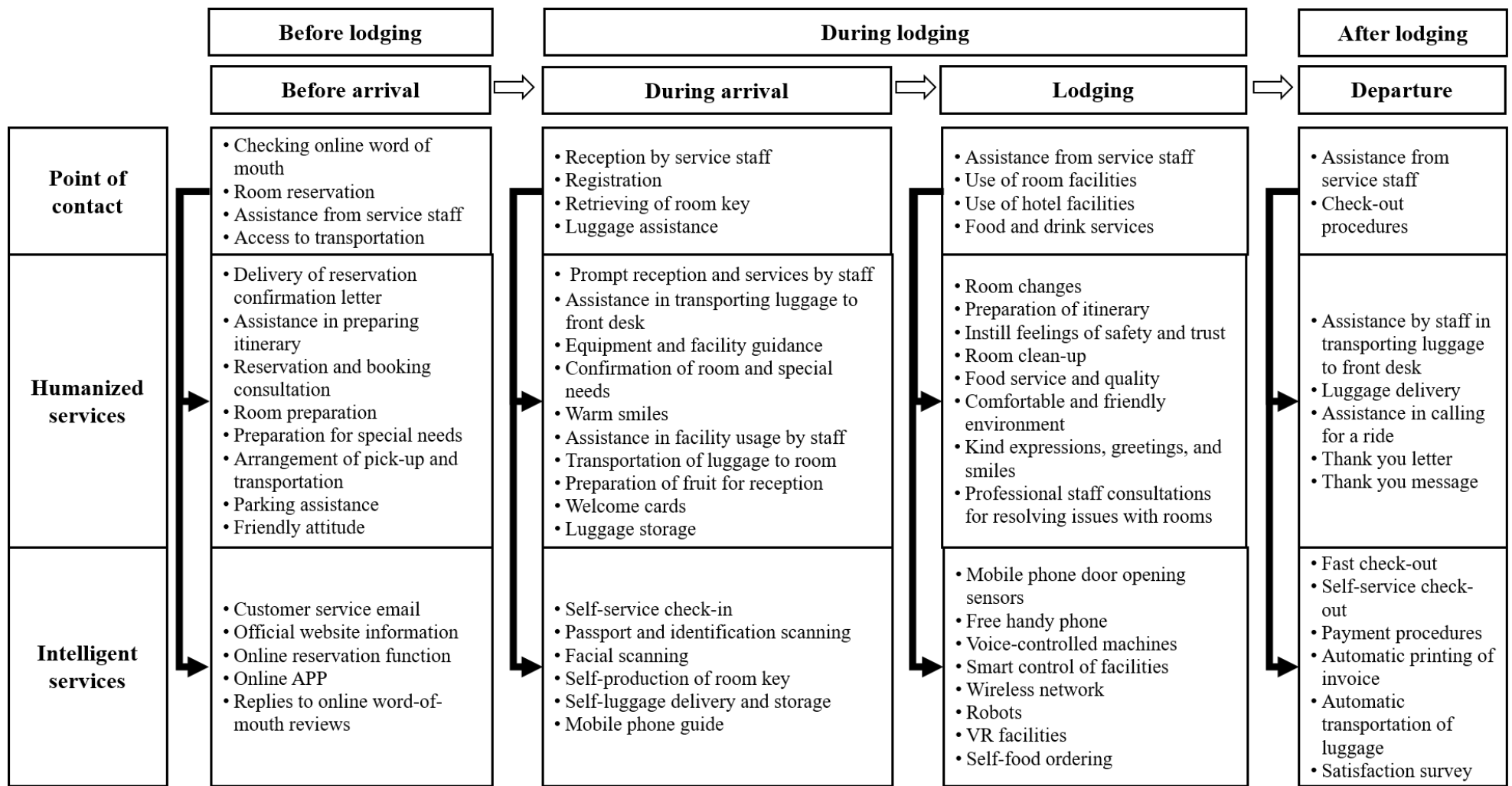
	Before lodging	During lodging		After lodging
	Before arrival	**During arrival**	**Lodging**	**Departure**
Point of contact	• Checking online word of mouth • Room reservation • Assistance from service staff • Access to transportation	• Reception by service staff • Registration • Retrieving of room key • Luggage assistance	• Assistance from service staff • Use of room facilities • Use of hotel facilities • Food and drink services	• Assistance from service staff • Check-out procedures
Humanized services	• Delivery of reservation confirmation letter • Assistance in preparing itinerary • Reservation and booking consultation • Room preparation • Preparation for special needs • Arrangement of pick-up and transportation • Parking assistance • Friendly attitude	• Prompt reception and services by staff • Assistance in transporting luggage to front desk • Equipment and facility guidance • Confirmation of room and special needs • Warm smiles • Assistance in facility usage by staff • Transportation of luggage to room • Preparation of fruit for reception • Welcome cards • Luggage storage	• Room changes • Preparation of itinerary • Instill feelings of safety and trust • Room clean-up • Food service and quality • Comfortable and friendly environment • Kind expressions, greetings, and smiles • Professional staff consultations for resolving issues with rooms	• Assistance by staff in transporting luggage to front desk • Luggage delivery • Assistance in calling for a ride • Thank you letter • Thank you message
Intelligent services	• Customer service email • Official website information • Online reservation function • Online APP • Replies to online word-of-mouth reviews	• Self-service check-in • Passport and identification scanning • Facial scanning • Self-production of room key • Self-luggage delivery and storage • Mobile phone guide	• Mobile phone door opening sensors • Free handy phone • Voice-controlled machines • Smart control of facilities • Wireless network • Robots • VR facilities • Self-food ordering	• Fast check-out • Self-service check-out • Payment procedures • Automatic printing of invoice • Automatic transportation of luggage • Satisfaction survey

Figure 4   Hotel Customer Journey Map for Technological and Warm Services

5.1.4 The Intelligent Services of Hotels Will Become an Important Development Direction in the Post-Pandemic Era

This research compiled the following development directions for intelligent services by the environmental changes during the post-pandemic era: 1. Use big data to understand customer needs, build membership databases, and increase management efficiency; 2. Carry out service upgrades in accordance with customer habits, while incorporating more distinguishing features; 3. Balance intelligent and warm services to strengthen the management of return customers; 4. Use the merging of service and smart technology to achieve the goals of controlling costs, increasing operating efficiency, and developing markets.

Hotels should use the advancements in intelligent service capabilities to improve work efficiency and service quality as well as resolve customer pain points through humanized services, allowing customers to feel the warmth of hotel services. Balancing the two types of services will most likely bring hotels greater business opportunities and guarantee more loyal customers.

5.2 Academic Contributions

5.2.1 Reflections on the Combination of Intelligent and Warm Services

There remains a lack of research on hotel intelligent services in Taiwanese academic literature, as well as relatively few discussions on the impact of smart hotel service processes on customer experiences and explorations that take the perspective of customer journey. This research adopted the perspective of the appropriate integration of warm services by smart hotels to make up for the shortcomings of past research. This research not only conducted interviews and on-site observation, but during the research process, it could truly be perceived that the appropriate integration of warm services into service processes by the 13 hotel practitioners helped to improve customer experiences, verifying once again the importance of the coexistence of intelligent and warm services.

5.2.2 The Dialogue between Hotel Practitioners and Consumers

Aside from the in-depth interviews of hotel practitioners, this research also conducted a word-of-mouth analysis centered on online customer reviews. Through the analysis and discussion of smart technology and service warmth using the perspectives of both hotel practitioners and customers, in conjunction with the results of qualitative interview content analysis and online word-of-mouth content analysis, this research gained a deeper understanding of the actual needs and expectations of customers during the service delivery process. This research thus makes up for the shortcomings of the service process designs of cross-strait hotels in regard to the use of technology and warm services to provide customers with memorable experiences at each service touch-point.

5.2.3 Enriching the Basic Frameworks of Academic Theories

Smart technology can improve management efficiency and optimize the entire service process, while warm services can effectively improve the interaction value between hotels and customers, verifying the importance of the coexistence of intelligent and smart services. This conclusion is in accordance with that of previous research (Ivanov and Webster 2019; Peng and Zhang 2020). Smart technologies and the production capacity of humans are mutually enhancing. While using technological services to improve service process efficiency, equal importance must be given to human services, in which the services of hotel staff add greater warmth to each touch-point within customer journeys. Such a finding thus responds to past literature's shortcomings (Lemon and Verhoef 2016; Stickdorn and Schneider 2012).

Customer journeys are a series of touch-point experiences that use different mediums at different stages. Past research focused on the feelings of customers at different levels of interaction and understanding the needs and feelings of customers at each touch-point during customer journey interactions. This research verified that each touch-point within service journeys plays an important role in determining the quality of customers' service experience. The actions which constitute service staff and customer interactions are crucial mediums for the transmission of service value and they influence the actual perceptions and overall evaluations that customers have regarding those interactions. Such a process may include the aspects of facial expressions, smiles, language, professionalism, and efficiency (Stickdorn and Schneider 2012). This conclusion matches that of the finding of Bitner, Booms, and Tetreault (1990) which contends that the physical environments, staff responses, and friendly customer service interactions of services all exert an impact to inform the actual evaluations of customers of the service experiences received during service encounters. This research has clarified that when incorporating intelligent services into customer journeys, the warmth of the human services provided at each touch-point greatly impact the complete experience of feelings and needs during the service process.

5.3 Practical Contributions

5.3.1 Recommendations on Process Optimization

Practitioner D mentioned that to balance the convenience of technology and the warmth of services, the service industry should generally contain human elements. In regard to the recommendation of this research to improve process commonality by optimizing the service processes of smart hotels, the 13 hotel interviewees also mentioned an increase in service quality owing to the increased efficiency of the combination of smart tools and human services. As practitioner B pointed out, "Intelligent services can simplify service processes, save labor costs, improve service quality, and decrease the waiting times of customers during customer journeys, allowing internal staff to have more time to attend to other problems; they can also, in a general sense, help to deliver services with greater warmth and quality. The research results regarding the practical optimization of processes are thus provided as a reference to smart hotels or businesses that plan to introduce intelligent services.

5.3.2 Exploring the Strengths of Cross-Strait Hotels, and Constructing the Service Warmth of Smart Hotels

Due to the influence of their respective environments, the intelligent services on both sides of the strait have followed different paths of development. This research explored the intelligent services of Taiwanese hotels but also visited and conducted on-site observation at hotels in mainland China. This research found that Taiwanese hotels' strength was service warmth, whereas the development of intelligent services in hotels in mainland China has occurred at a faster pace than Taiwan. While Chinese hotels are able to offer many intelligent services that Taiwan cannot, Taiwan specializes in the optimization of service process details through providing meticulous and warm services and giving customers a "home away from home" type of service experience, featuring the remembering immediately in front of customers their specific food and drink and other preferences). This research has also constructed a cross-strait comparison table. While reinforcing their respective advantages, it seems the case that hotels on both sides of the strait can learn from each other's strengths to improve their competitiveness.

5.3.3 Summarizing the Future Development Directions of Smart Services

Through online word of mouth, interviews, and on-site observation and experiences, this research was able to gain a more comprehensive understanding of the service processes within the customer journeys at hotels. Using advancements in intelligent service capabilities to improve service process efficiency and service quality, along with humanized design to provide more convenient and customized services, serves as an innovative model that combines intelligent and smart services that appears virtually certain to provide new business opportunities and a brand-new solution for hotels.

6. Research Limitations and Future Research Directions

6.1 Increase of Scope

Follow-up research can use the results of this research as a basis to conduct more quantitative surveys on the service delivery systems for "intelligent services" and "warm services". Future empirical research should be based on more extensive data collection and analysis tools and large quantities of sample surveys to obtain more reliable general results.

6.2 Scope of Research Sites

This research focused on the exploration of cross-strait hotels. In the future, other countries and cases can be referenced. Such examples might include, Henna Hotel in Nagasaki prefecture, Japan and & AND HOSTEL—Japan's first IoT hotel, in Fukuoka. Additionally, YOTEL New York Times Square and Loews Hotel 1,000 Seattle in the technologically advanced United States, as well as London's Eccleston Square Hotel, are equally worthy of being chosen as research participants. If future research can include regions across the globe, more holistic and complete analysis is likely to be produced.

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