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AN INVESTIGATION OF AUTOMATION AND HUMAN INTERACTION OF UPSCALE HOTELS IN CHINA

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Abstract

The hotel artificial intelligence process creates a three-generational innovation framework—automation, thinking, and feeling technology—demonstrating how different technologies can be applied to different aims in the frontline service setting. Prior research has demonstrated the strategic significance of information and communication technology. This is a classic question that has garnered much attention in integrating “high-tech” and “high-touch” service as “High-T2” service in hotels and how balancing the two sides affects visitors’ perception and behavioural intention. There is still much effort to examine how the components involved in “high-tech” and “high-touch” service can influence visitors’ pleasure; how different guest attributes can control their satisfaction and loyalty during the service process. The project attempts to fill gaps in “High-T2” service and provide a framework considering technology and human interaction. This study set seven research objectives to discuss and explain the research issue. When these two factors are combined, “High-T2” can be essential to visitor pleasure and guests’ goal to create and maintain a stable long-term connection and commitment in the hotel sector.

Keywords: High tech, high touch, loyalty, satisfaction, upscale hotel

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1. Introduction

Artificial intelligence (AI) is a brand-new technical field that aims to simulate, extend, and enhance human intelligence by using theories, methods, technologies, and application systems, to achieve specific goals and tasks through flexible adaptation (Haenlein & Kaplan, 2019). S. Y. Kim et al. (2019) found that anthropomorphized consumer robots warm consumers' hearts and that social robots use natural language to interact with customers (D. Lee et al., 2018). In addition, AI-based solutions are considered competent to completely substitute human activities while improving transaction speed and accuracy, as Ayala-Rincón and Muñoz (2017) suggested. Service robots, for instance, automate social presence in the frontline, communicate with consumers in a scaled and reliable manner, and are already a common feature of service interactions (Mende et al., 2019).

In China, the hotel artificial intelligence process is developed through a three-generational framework for innovation—automation, thinking, and feeling technology that illustrates how different technologies can be used for different goals in the frontline service context (Huang & Rust, 2021). In the innovation and automated technology period, hotels pay more attention to the reservation system, automatic check-in, facial identification, AI room service control and operating system. In the thinking technology, hotels focus on the automation of guest experience and brand quality management, providing insight into the control of service quality and helping guests make decisions. For the last framework, the feeling technology, hotels use data to drive operations and management decisions. From artificial intelligence operations to providing personalized service experiences to guests, AI can be reflected in financial indicators and market data. For instance, according to the report released by World Intellectual Property Organization (2019), 70 percent of AI-related inventions combine two artificial intelligence technologies, applications or fields, and delivery service robots in hotels are one of the representative applications of this combination (International Federation of Robotics, 2019).

Prior studies (e.g., Bahrini & Qaffas, 2019; Buhalis, 2020) have established the strategic importance of information and communication technology. For instance, JW Marriott Hotel, InterContinental Hotels Group PLC, and Starwood Hotels & Resorts Worldwide, Inc. have focused on the hotel's intellectualization and paid attention to Chinese marketing since 2014. The hotels installed voice-activated room systems or robotic servers (Luo & Pan, 2021). Since 2009, a few upscale hotels in China have started researching the path of low-carbon environmental protection and intelligent information (Li & Azman, 2022). Ali Group China started exploring the smart life sector in 2015 and created the Smart Life Division (Luo & Pan, 2021). In 2018, AT-LAB of Atour Hotel Group cooperated with Tencent Cloud to create smart experience rooms to explore the temperature and personality that technology should have in the AI era (Zhang & Lu, 2021).

1.1. Issue in Perspective

Buhalis and Sinarta (2019) argue that owing to the innovative nature of automatic and intelligent technologies, services in hotels have new essential features such as co-creation and data-driven. Hotels must embrace technology's full potential to create more personalized guest experiences (Buhalis et al., 2023). On the other hand, employee interaction significantly contributes to the guest experience and

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organizational performance (Heskett et al., 1994; Pugh et al., 2002; Subramony & Pugh, 2015). From this point of view, hospitality requires a "human touch" service; even though adopting technology might significantly contribute to increased process efficiency, it must still meet guest expectations for human-provided hospitableness (Solnet et al., 2019). However, by reviewing the literature, there are many points of view regarding guests' preferences for "high tech" versus "high touch." As a matter of fact, little research combines "high-tech" and "high-touch" in a single study. In the digital world, hotels operate on massive amounts of data, and the adoption can raise concerns about guest privacy and data security (McCartney & McCartney, 2020). Meanwhile, guests may feel uneasy or distrustful of interactions with AI-powered technologies (Mazurek & Małagocka, 2019). Fomby and Kravitz-Wirtz (2019) has shown that these are the limiting factor in hotels, reported to have difficulties in providing seamless services. Thus, one more main problem is balancing the increasing level of technology and the human interaction service in this situation.

There have also been studies on the relationship between guest satisfaction and loyalty to essential hotel attributes (Al-Dmour et al., 2019; Akroush & Mahadin, 2019; Schirmer et al., 2018). However, Boonlertvanich (2019) shows that satisfaction indirectly affects loyalty. Research by Leonidou et al. (2021) supports the existence of a positive satisfaction–loyalty link within a marketing channel context. The issue of mediating effects on the relationship between satisfaction and loyalty in smart technology warrants studies to be undertaken to fill the gap. Customers' affirmation of service will not directly lead to guest loyalty; it must pass through the intermediate transmission variable of guest satisfaction (Ullah et al., 2018). Sasono et al. (2021) have proved through empirical research that when consumers are satisfied, their intention to purchase or experience a product or service generally increases and leads to guest loyalty in the long term.

1.2. Aims of the Study

Lapré and Drexler (2019) discuss the pros and cons of technological advancements in the hospitality industry and raises the diverse guest behaviour issues that need to be considered, especially in instances of greater guest involvement in the service delivery process. This is a classical question that has received considerable attention in combining the "high-tech" service and "high-touch" to be renamed as "High-T²" service in hotels and how balancing the two sides affect the guests' perception and behavioural intention. Much work is still required to investigate, for instance, how the factors involved in the "high-tech" and "high-touch" service can influence guests' satisfaction; the different guests' characteristics can moderate their satisfaction and loyalty during the service process. Thus, the study aims to address gaps in "High-T²" service and develop a framework that accounts for both technology-based and human interaction based.

2. Dimension of Study

2.1. High Tech

High technology (High Tech) is the most complex or the newest technology on the market (Powell, 2003). High technologies in hotels, such as interactive social hubs, chatbots, in-room smart

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technologies and robots that can be applied during the stay, create a unique guest experience by providing the guest's opportunity to receive a variety of helpful information and entertainment, saving them time and being at their disposal (Lukanova & Ilieva, 2019). Furthermore, the application of AI in the hotel service process allows the elimination of the language barrier, which facilitates the service (Ivanov & Webster, 2019).

2.2. High Touch

High Touch, in contrast with High Tech was first coined in 1982 by John Naisbitt in his book Megatrends (Hapoienu, 1990) and refers to the provision of personalized attention and service (E. Anderson, 1995). High Touch often drives the design of new services (Bearden et al., 1998; Cook et al., 1999), influences the potential efficiency of service operations (Chase, 1981; Chase et al., 1984; Walley & Amin, 1994), and is a primary determinant of overall service quality perceptions (Parasuraman, 2000; Pugh et al., 2002; Soteriou & Chase, 1998). In the hotel industry, the High Touch service typically includes some frontline interaction or interpersonal exchange that creates the human touch (King, 1995). Reuland et al. (1985) and Brotherton (1999) argued the importance of personalized service in the hospitality industry. The roots of High Touch services in the hotel industry lie in the unique emotional bond of warmth and trust between hosts and guests (Lashley, 2000), suggesting that value-creation in hospitality requires a deeply human touch.

2.3. Outcome Variables for High Tech High Touch

The marketing literature suggests that the quality of the offered goods or services is key in influencing the end user's satisfaction (E. W. Anderson & Sullivan, 1993). Many studies have been conducted to investigate the impact of technological amenities on hotel guest satisfaction (Cobanoglu et al., 2011; Jung et al., 2014; Usta et al., 2011). For instance, guest satisfaction is based on a guest's overall relationship experience with a specific high-technology product or service supplier, including their product or service experience (Johnson & Fornell, 1991; Lam et al., 2004; Shankar et al., 2003).

Another key component of the technology-mediated customer service model is the inclusion of human interaction, which can significantly impact guest satisfaction (Heskett et al., 1994; Parasuraman & Colby, 2001). Within the antecedent categories, special care during human interaction may play a significant role in satisfaction formation (Chiou & Pan, 2009). It can impact personalized service and is a decision that weighs the likely outcomes of purchasing against the inputs foregone (Dellaert et al., 2020). Moreover, it can manifest as pure emotional states during the transition from High Touch service to satisfaction (Satzger et al., 2022).

Guest loyalty has been widely regarded as a fundamentally important concept in marketing literature due to its positive outcomes, such as competitive advantage, higher profitability, and cooperative behaviour (Aaker, 1992; Reichheld & Sasser, 1990). Similarly, guest experience management focuses on operations and processes tailored to individual customers' needs (Winer, 2001). Its goal is to convert satisfied hotel guests into loyal guests and then loyal guests into hotel advocates (Botha & Van Rensburg, 2011; Gentile et al., 2007; Klaus & Maklan, 2013; Verhoef et al., 2009).

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2.4. Proposed Hypothesis

Previous research has shown that hotel technology can improve guest satisfaction, increase productivity, and competitive advantage, resulting in stable guest loyalty (Cobanoglu et al., 2011; Enz & Siguaw, 1999). Similarly, other studies have discovered that personalized service based on human interaction is an important factor that can positively affect guest loyalty (Guenzi & Pelloni, 2004). Thus,

H1: High-T2 (High Touch - High Tech) has a significant relationship with Guest Loyalty

According to Naumov (2019), technological advances have enabled many businesses, including hospitality and tourism, to "transform" their operations, lowering costs, increasing productivity, and improving the efficiency and dependability of their services. On the other hand, the service literature is replete with studies on how High Touch services, such as authentic smiles (Grandey et al., 2005), a warm welcoming with the opening of the doors, friendly greetings with help handling luggage (Solnet et al., 2019), and authentic caring behaviour straight from the heart, add value to a guest experience and effect satisfaction (Ariffin & Maghzi, 2012). Therefore,

H2: High-T2 (High Touch and High Tech) has a significant relationship with Guest Satisfaction

Reynolds and Beatty (1999) discovered a positive relationship between guest satisfaction and organization. Interactions between guests and frontline employees influence guest satisfaction and loyalty (Beatson et al., 2006). Hence,

H3: Guest satisfaction has a significant effect on Guest loyalty

Satisfaction is a post-usage phenomenon that is purely experiential and results from comparative processes (Mazursky, 1989). According to previous research, guest satisfaction positively impacts guest loyalty, service and product usage behaviour, usage levels, revenues, and cash flows (Tarasi et al., 2013). Therefore, hypotheses for satisfaction and loyalty are formulated for both components.

H4: Satisfaction in High-T2 has a relationship with guest loyalty

According to Bilgihan et al. (2011), the importance of business entertainment amenities (such as in-room fitness facilities) differs significantly between business and leisure guests. On the other hand, individuals from a particular generation, according to Sullivan et al. (2009), can be distinguished from members of other generations not only by shared birth years but also by the unique social and historical experiences of the members' youths, which have permanently influenced their characteristics. The following research hypothesis sought to test this:

H5: Customer segment (age, gender, education and travel purpose) as the moderate variable has a significant relationship between High-T2 and guest loyalty.

According to research, guest satisfaction may be related to customer segments (Barsky & Labagh, 1992). For example, females, older customers and customers with less education tend to be more satisfied (T. J. Lee et al., 2012). Thus, based on the findings of the previous studies, we hypothesize the following:

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H6: Customer segment (age, gender, education and travel purpose) moderate the relationship between guest satisfaction and loyalty.

3. Research Methodology

3.1. Research Approaches

This study intended to adhere to the pragmatist paradigm, which recognizes that there are several ways of perceiving the world and doing research, that no single point of view can ever provide the whole picture, and that there may be multiple realities. The pragmatism paradigm is an alternative philosophical position that gives an epistemological explanation and logic for method mixing (Feilzer, 2010) by doing the research perfectly well and representing the best side of both objectivism and constructivism worldviews (Lincoln et al., 2011). The pragmatic approach of using a mixed-methods design secures potential compatibility and increases confidence in findings by complementing one another (Patton, 2002). In this research, the researcher collects qualitative data in the first phase, analyzes the results, and then initiates the quantitative phase to explain the framework results further.

This research focuses on the automation and human interaction in the artificial intelligence service marketing of upscale hotels located in China, the region's leading tourism destination. As a major international metropolis and innovative China city, Shanghai has become an international service and technology innovation hub for China (Wu et al., 2021). Many hotels in this global city are taking advanced technologies to a new level and keeping the international high standard of service for guests (Chan et al., 2021).

In the qualitative study, the five semi-structured interviews will be conducted at the respondents' workplace; participants are frontline senior managers who have ten years of working experience and operators; they play the critical intermediary role between the hotel and guests, also freely reflect their knowledge, ideas, and thoughts about the High-T2 adoption and the relationship between guest loyalty and High-T2 in the company-centric perspective. In the quantitative part, the self-administrated questionnaire will be conducted for the participants who had upscale hotel stay experience in the last twelve months.

3.2. Sampling Frame

Probability and non-probability are the two types of sampling designs (Saunders et al., 2007). Probability sampling determines the possibility of each example being chosen from the whole population and virtually constant across all cases. Sekaran (2003) claims that the probability sampling method is used when the sample's representativeness is vital to generalize the characteristics of the total population. As this study has to make general conclusions about the balance between automation and human interaction in the artificial intelligence service marketing of upscale hotels in China, it is necessary to use probability sampling.

The sample size is a frequently-used term in statistics and market research. For the population size, it is common to have an unknown number or an estimated range, as vast numbers of guests stay in upscale hotels in Shanghai every year. Saunders et al. (2007) suggested sample size of the research

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population should be a minimum of 278 samples; if the population is 1000 and the margin of error is 5 percent

3.3. Research Instruments

Semi-structured interviews are among the most challenging to conduct (Bearman, 2019). For the procedure of the semi-structured interviews in this study (Figure 1). The interviewer should control the rate of interview progress and finish it between thirty to forty-five minutes; otherwise, the respondents will also feel fatique and tiresome, affecting the quality of the responses.

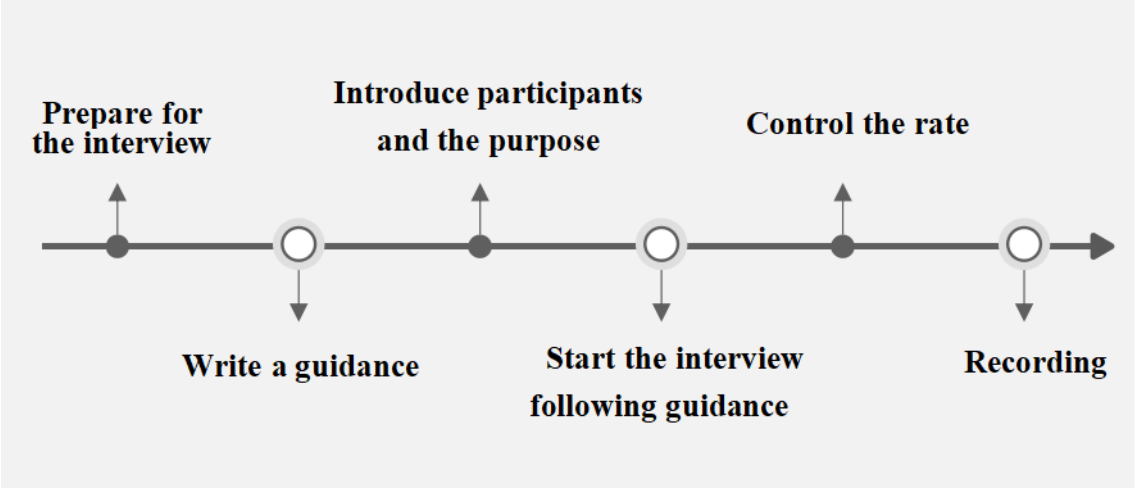

Figure 1. Procedure of semi-structured interviews

Following the semi-structured interview procedure, researchers will ask five open-ended questions to hotel senior managers face-to-face, from the leading and straightforward questions to the complex and profound questions.

The questionnaire will also be employed to measure the respondent's experience with the "High-tech" and "High-touch" services in the upscale hotel. Hudson and Manning (2019) proposed dividing the questions into sections. Thus, in this study, the self-administered questionnaire will be divided into five sections, including the demographic profile of respondents, gender, education level, income level, and travel purpose. The second section focuses on the High-Tech service that guests experience in the hotel, particularly looking into the advanced technology's four different factors (intelligentization, functionalization, privacy, usability). The third section is related to the personalized service opposite to the High-Tech service. The fourth section examines satisfaction with the advanced technology equipment and the special care service. The final section investigates guest loyalty, behaviour such as re-stay, and hotel recommendations. The sections will be carefully planned to address the variables to suit the research objectives (Portney, 2020).

3.4. Measurement Scale

According to Rahi (2017), using a proper scale will enable the measurement of respondents' true feelings, perspectives, and opinions. In this study, a seven-point Likert-type scale will be used for

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statements expressing ideas or feelings about an object or individuals to assess specific attitudes (León Mantero et al., 2020). In this study, each item will have a minimum of "1" and a maximum of "7" on the rating scale. A score closer to "7" means a very strong attitude in favour of the statement, while a score close to "1" means a very strong attitude against the statement. There also will be a "4" as a neutral point means the respondents have no solid attitude that can express their actual state of feelings. From the perspective of Kozyreva et al. (2023), a neutral category provides a means of escape for respondents who are hesitant to express their ideas.

3.5. Pretest

In this research, the pretest will have two stages; the first is for the qualitative study, which refers to the semi-structured interview pretest. According to Ikart (2019), pretesting is necessary to ensure that the researcher will acquire accurate, reliable data from the survey technique, and it is essential to emphasize the importance of the pretesting questions, (1) the way the survey is carried out; (2) the duration of the interview; (3) problems with the question; and (5) the challenge of appropriately interpreting the meaning of each word. Prominent research scholars and hotel senior directors or managers will be contacted to avoid any issues in the data collection.

The second part of the pretest is about quantitative study. The administered questionnaire will be provided with a cover letter outlining the study purpose, the confidentiality of the information and the researcher's contact information. During the pretesting, an English professional editor will check on the language first. Then the researcher will translate the questions from English to Chinese using a professional translator, and finally, another expert will back translate from Chinese to English to let the respondent better understand the question given and check whether the meaning is similar to the original one.

3.6. Pilot Test

Following the pretest, a pilot test for the semi-structured interview will be carried out with five senior managers or department directors. In this pilot test, these five senior managers will go through the open-ended questions and discuss the modifications from their perspectives; a few comments and responses during the process will be obtained and carefully reviewed and refined to avoid any conceptual ambiguity as well as to ensure the conceptual framework is making sense.

On the other hand, for the self-administered questionnaires, 30 samples from prominent research scholars will be asked to do the pilot test within ten days after the semi-structured interview pilot test. This pilot research is being carried out in order to make sure that the study's target respondents will comprehend all of the instructions and statements in the questionnaire and to check for any potential chatbot and Google Forms software problems, identify questionnaire deficiencies and problems with layout and design, solicit feedback, evaluate the suggested allotment of time for responding to the questionnaire, and assess the degree of understanding of the built-in questionnaire. After a review of the pilot test results, several changes will be made.

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3.7. Validity and Reliability

Validity is the capacity of research findings to accurately predict outcomes in groups of individuals who behave similarly outside the study (Juliana et al., 2021). The content validity of a test or assessment instrument is one way to gauge its reliability. High content validity indicates that the test fully covers the topic for the target audience (Clark & Watson, 1995). In this research, prominent research scholars in the hospitality industry will be invited to confirm the validity of each question on the questionnaire, and the senior managers and hotel general managers will be asked to check the validity of each interview dialogue sentence separately.

Additionally, reliability is defined as the extent to which results are consistent over time, an accurate representation of the total population, and can be reproduced under a similar methodology. The degree of consistency, the correctness of the measurement data, and the dependability of the assessment results all indicate the size of the random error in the measurement (Mohajan, 2017). In this research, the scale's reliability will be measured through statistical software to calculate the Cronbach alpha coefficients, which should all be higher than 0.70.

3.8. Data Collection

As mentioned before, respondents are senior managers with more than ten years of working experience from upscale hotels and operators in the qualitative data collection process. Additionally, phone calls will be made to all relevant hotel owners and managers to gauge their interest in participating in the study and undertaking the semi-structured interview face-to-face in their working place. Leading questions might sway respondents' replies and raise the possibility of skewed results; thus, the researcher should avoid asking any of them. Each interview will last between thirty to forty-five minutes on average. The practical impact of the non-sampling or the missing data in the process is reducing the sample size available for analysis. Therefore, an appropriate action or remedy must be taken to ensure the original pattern of the data can be maintained.

In the quantitative data collection process, 300 self-administered questionnaires will be issued, as mentioned in the sampling part, and the respondents will be asked to complete the questionnaire through a web-based survey, such as Google Forms, Survey Monkey, or Wenjuanxing China. Generally, for the first part, several criteria will be outlined in selecting the respondents. Those who had an experience in an upscale hotel during the last twelve months will be qualified to participate in this study. Before the data collection period, a briefing will be held for the respondents about emphasizing the research topic's intention and importance. All of the respondents' answers in these forms will be fed directly into a spreadsheet automatically composed as entries are made in the form.

3.9. Plan for Data Analysis

The data analysis methods are concerned with the collection of and analysis of written or spoken texts or the direct observation of behaviour. Atlas Data coding and thematic analysis will be performed first. The first step in qualitative analysis is to seek knowledge and understanding of the whole story, how

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they illustrate the thoughts, and how these create a deeper understanding of the High-T^2 service and guest loyalty from the participant's view.

For quantitative data analysis, there will be two steps. Firstly, the data will be analyzed using Statistical Package for the Social Sciences, Software Version 24 (SPSS 24). At the same time, several types of pre-determined analyses will be undertaken: internal consistency, descriptive statistics, and exploratory factor analysis (EFA). Secondly, the Structural Equation Modelling-Partial Least Square (SEM-PLS) using SmartLPS 3.0 will be adopted to estimate the relationships between the latent variables and determine how well the model explains the target constructs. Then structural equation modelling with partial least squares would be used to analyze the outcome based on this study's research objectives, questions, and hypotheses.

4. Significance of the Studies

The implementation of AI technology is expected to result in substantial efficiency gains on both the hotel operator and the guest's side from benefits such as cost reductions, increased flexibility, increased access, and time savings (Ivanov & Webster, 2019). Meanwhile, kindness, genuineness, welcome and respect in human interaction have been the foundation of hospitality (Solnet et al., 2019). On this basis, Tkach et al. (2017) suggest that service employees add a human touch that is a "unique dimension to technology, regardless of functionality". Thus, in this research "High-T²" service combines the advantages of "high-tech" and "high-touch," it is crucial in adding a more personal touch, increasing interactions and engagement, developing more meaningful relationships, and adding value to the overall experience.

The GM of Hotel Lugano Dante underlines that "the use of technology can add real value to the service, but the service itself must be of high quality as technology on its own does not provide good service but can only be used to enhance good service" (Luè, 2022, p.18). It means technology as a value-added amenity to help create differentiation and enhance guest satisfaction, but it cannot ignore the importance of human interaction. Furthermore, Lin et al. (2020) find that emotional interaction is more likely to be satisfying and result in positive guest evaluations; it may be the most crucial factor influencing overall guest satisfaction and repeat visit intention. Thus, combining them, "High-T²" can be a significant part of guests' satisfaction, and it also affects guests' intention to develop and maintain a stable long-term relationship and commitment in the hotel industry (M. Kim et al., 2020).

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