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The Role of Expected Benefits towards Smart Hotels in Shaping Customer Behavior: Comparison by Age and Gender

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Abstract: The present study attempted to provide foresight into the hotels of the future in response to the Fourth Industrial Revolution. In particular, this research aimed to understand customers' expected benefits, many of which are rooted in the characteristics of a smart hotel, as well as to discover the role of expected benefits to build perceived value and attitude, which in turn increase the behavioral intentions towards a smart hotel. Furthermore, the moderating effect of age and gender was tested in the link between the expected benefits and perceived value, and the association between the expected benefits and attitude. The results of our analysis determined how personalization and entertainment, as well as safety and security, had a leading role to shape customer behavior, and how age moderated the link between entertainment and attitude. The discussion and implications were conducted in light of these findings.

Keywords: smart hotel; expected benefits; perceived value; attitude; behavioral intentions; age; gender

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1. Introduction

Technologies have become ingrained into our society. Entrepreneurs have embraced a wide range of innovative technologies in order to upgrade their offerings, and as such they have restructured many of their operations [1,2]. Connectivity, data, and smartness are the main keywords that characterize the features of emerging and novel technologies in the context of hospitality and tourism [3]. Likewise, operational excellence in the hospitality industry through data-driven systems, digitalized service platforms, and smart devices are often discussed [4,5]. Furthermore, this phenomenon has accelerated due to the growing needs for contactless service delivery in the wake of the coronavirus disease (COVID-19) [6]. Hotels are relying on technologies now more than ever.

The dramatic development of the hotel industry to lift customers' expectations to the next level has provoked a fierce competition among hotels [7]. In order to build the core competitiveness of hotels, the adoption of high technologies was repeatedly listed as the most valid means [4,8]. The level of technology adoption varies by hotel. However, there are hotels that visualize themselves as smart hotels by accepting various technologies for a customer's experience. A smart hotel, which is a practical term that is described as a hotel that embraces the innovative technologies that has less reliance on human employees in order to provide an exceptional customer experience [9]. Similarly, Petrevska et al. [10] stated that the concept of smart hotel possesses an enormous technical capability to make use of every opportunity to provide customers with a compelling experience.

In the field of technology-powered products/services, the expected benefits are one of the essential indicators of consumer behavior [11–13]. The significant importance of expected benefits is also explained using the technology acceptance model (TAM) [14], which posits perceived usefulness and perceived ease of use as the key determinants

with the individuals' adoption. The extant literature contains many studies that explored the benefits regarding what the customers can expect from innovative technologies and technology-mediated offerings in the service sector [15,16]. Kabadayi [4] articulated how smart services, data integration, and connected technologies capture individual distinctive needs in various environments, so that customers can enjoy more individual tailor-made services. Xu [7] explained how smart hotels presently exceed the diverse needs of the customers through a comprehensive service platform. Christou [17] examined the roles of the robots in the hospitality and tourism industry, and they discovered that the anthropomorphic robots improve customers' experiential value. Hwang and Kim [11] discussed the expected benefits towards the food delivery services using drones, and they confirmed that the compatibility, convenience, emotions, functions, and social influence are the key aspects from the customers' perspective, which in turn build positive consumer behavior. The stream of these studies generally highlights how cutting-edge technologies assist individuals with a greater level of service quality [18]. Furthermore, a great deal of evidence indicates that the benefits that customers gain from advanced technologies enhance their experience [4,9].

Scholars who explore customers' expected benefits related to innovative technologies in the hospitality industry commonly and individually propose the following facets that include efficiency, personalization, and entertainment, as well as safety and security [8,11,19]. Nonetheless, these expected benefits have not been tested in the context of smart hotels, and the roles of the expected benefits towards smart hotels to form consumer behavior have not been identified. Smart hotels are highly differentiated from other hotels due to the extreme degree of penetration of innovative technologies into the hotel's operation. Thus, it is likely that the underlying dimensions of individuals' expected benefits towards smart hotels are derived from the distinctive characteristics of technologies that are employed in smart hotels. However, the attempts to provide the empirical evidence regarding how consumers perceive smart hotels are not sufficient. Instead, the existing studies that pertain to expected benefits towards smart hotels are largely approached using a cost-benefit analysis from an operator standpoint [2,20]. Therefore, the present study is designed to fill the void. More specifically, the objectives of this study are to (1) investigate the role of customers' expected benefits towards smart hotels in the development of perceived value and attitude, and (2) to examine the relationships among perceived value, attitude, and behavioral intentions. In addition to this, this study considers the demographic profile as an important moderator based on the existing studies, which validated its moderating role to form the consumer intentions [21,22].

The remainder of this study is organized in the following manner. First, the extant literature, which delves into the advanced technologies of smart hotels to form the customers' expected benefits, is introduced in conjunction with the consequences and the potential moderators. Second, the research questions and the conceptual models are illustrated among the key constructs. Third, the measurement instruments and the sampling procedures are described. Fourth, the data analysis and results are presented. Finally, the implications of the research findings and the limitations are discussed.

2. Literature Review

2.1. The Rise of a Smart Hotel

Technological evolution continues every second of every day, and the innovative technologies in the hospitality and tourism industry presently range from artificial intelligence (AI), information and communication technologies (ICTs), the Internet of things (IoT), robotics to virtual reality (VR), and augmented reality (AR) [1,5,23,24]. The advancement of technologies redefines the offerings and how the hotels operate in order to deliver products/services to customers [18,25].

A smart hotel is defined as "a hotel which makes use of advanced technologies to streamline its operation in interacting with customers" (p. 805) [9]. Nevertheless, smart hotels do not necessarily mean hotels without human touch. It is more focused on the

balance between innovative technology and the human employees [26]. Smart hotels boast an outstanding performance through intelligent guest rooms, automated services, and robotics throughout the hotels. For example, Wu and Cheng [27] described how cutting-edge technologies with the accommodations in establishments, such as a voice control systems, improve the quality of the customer experience. Domanski [26] explored individual perceptions towards smart hotels through in-depth interviews, and the author found that novel technological solutions significantly contribute to the improvement of the service quality. Moreover, Foris et al. [28] conducted a case study on one of the smart hotels located in Romania in order to identify the fundamental effect of implementing innovative technologies in hotels. They determined that smart rooms supported measures that reduced energy and water consumption. In other words, smart hotels contribute to sustainability. As such, Xu [7] asserted that a smart hotel is an inevitable product for the creation of smart tourism, and smart hotels will become the hotels for the modern people to travel to.

2.2. Expected Benefits towards a Smart Hotel

The pervasive adoption of innovative technologies implies the substantial potential for the success of business in the hotel industry. There are core elements that customers appreciate, which in turn increase the positive perception towards technology mediated and powered products/services [11,29]. In this regard, the expected benefits are conceptualized as the individuals' anticipated advantages regarding using specific innovative products/services [13]. Even though no attempt has been made for the comprehensive understanding of the expected benefits towards smart hotels, a considerable amount of the existing studies investigated the expected benefits towards new technologies in the context of hospitality and tourism [9,11,19]. The consensus of these findings suggested that the efficiency, personalization, and entertainment, as well as safety and security are the determining benefits regarding customer expect.

People generally perceive a better performance as being more efficient when innovative technologies are associated in the offerings [30]. Efficiency is examined as one of the salient aspects, which results from accepting the cutting-edge technologies [23,27]. Christou [17] conducted a series of interviews regarding the perceptions towards robots, and they found that tourists commonly appreciate the advantages that involve the efficiency of robot delivery services. Kim et al. [18] observed efficiency as a driving force of the performance of smart hotels, because it contributed to building the customers' favorable attitude. In other words, a wide range of advanced technologies, such as AI-based chatbots and digital concierges, enable hotel practitioners to manage their operations more efficiently. Thus, the customers enjoy efficient services without providing a lot of effort and time, which eventually induces positive customer responses.

The enormous potential of innovative technology to engage customers in a more personal way has been recognized [28,31]. Particularly, mobile solutions for the personalization of customer experiences are popular [32]. For example, Neuhofer et al. [8] discussed the smart technologies for a personalized experience in the hospitality industry, and they determined how smart mobile technology solutions facilitate customized services. This means that customers can easily request services through their own mobile devices regardless of the place or time, and the individual mobile devices are used to enter the rooms at smart hotels. Furthermore, the data-driven services are helpful for the personalization of offerings at given locations and times. Customizing services according to individuals' preferences improve operational excellence [5,24], and it is expected to enhance the value that customers perceive, and their attitude toward specific service providers.

Entertainment, which involves enjoyment and fun activities, is frequently studied as the benefits that customers appreciate in regard to their use of technology-powered products/services [30,33]. Robots in service delivery are a perfect example, and a lot of research stated that the arrival of robots in the service sector allows for fun interaction with the customers [34]. Lin et al. [35] observed how AI robotic devices benefit customers'

hedonic demands in both full-service and limited-service hotels. Meanwhile, Tussyadiah et al. [19] described the rapid development of VR in the field of tourism and tested the impact of VR regarding changing customer attitudes and behaviors. The results provided empirical evidence that validated the important role of enjoyment to shape the individuals attitude and behavior. Hwang and Kim [11] identified the positive emotions, such as fun and happy as some of the expected benefits of using technology-mediated services in the food delivery services, and they confirmed the effect of emotions on customers' positive responses.

At smart hotels, a high standard of safety and security are commonly anticipated. For instance, Kim and Han [9] addressed that a great level of safety and security is the core attribute of smart hotels, and they described how novel technologies are helpful to detect the hidden dangers and minimize risk. Similarly, Xu [7] illustrated how enhanced monitoring systems easily sense danger and detect fires, and they provided the corresponding measures. More recently, Go [36] discussed robots with machine learning applications, which are built to protect the customers' safety and security in the hospitality industry. In addition, the COVID-19 pandemic generates many cases where technologies play a better role in crisis management, because they offer smart solutions with support in order to avoid human-to-human interactions [6,11,37].

Therefore, efficiency, personalization, and entertainment, as well as safety and security seem to be salient benefits that customers expect from an experience at smart hotels. Moreover, these expected benefits underlie the positive customer responses and thus promote perceived value and attitude in forming the future intentions towards a smart hotel.

2.3. Perceived Value

Perceived value is delineated as the customers' evaluation of the received quality of offerings, and it is thereby frequently associated with benefits that they perceive [38]. Sigala [3] articulated the embedding smartness such as recommending system and virtual tours in the tourism sector and summarized how emerging technologies promote value co-creation. de Kervenoael [34] explained the adopting of robots in the service encounter as the service providers' commitment to value creation, which has become a requirement to fulfill the customer expectations of today.

The studies constantly provide evidence that the perceived value toward new technologies aids customers to develop a favorable attitude [39]. Ashfaq [40] examined the perceived values of smart speakers of customers in the US, and their results supported that the functional, hedonic, and economic aspects of perceived value increase the consumers' attitude. In addition, perceived value has been explained as a key antecedent of the consumer behavior on the basis of the value-attitude-behavior approach in the hospitality industry. This means that the consumers' perception on values from the offerings exerts a significant influence on the formation of attitude, which in turn affects their decision-making. For example, Feng [41] examined the modern service experiences, which are largely driven by the technological tools at luxury hotels, and their results supported the framework of the value–attitude–behavior model. Meanwhile, perceived value was also validated as a direct influencing factor of the positive behavioral intentions [34,42]. Hong [43] tested the relationship between value perception and continual intentions to use smart watches, and their results discovered significance.

2.4. Attitude

Attitude was conceptualized as "the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (p. 188) [44]. As a volitional factor in forming an individuals' future behavior, attitude is often postulated as a core construct in various social psychology theories [16,22]. Hence, attitude has been repeatedly examined as a strong power to predict customer behavior across different sectors, which include the hospitality industry [40]. In the same manner, studies have observed that an individual's attitude is of great importance to form consumer behavior toward technology-

based products and services. For example, the significant association between attitude and behavior has been validated with the adoption of information systems [45], mobile applications [39], and robots [46]. For example, Hwang et al. [22] examined the relationship between individual attitudes towards innovative technological services and behavioral intentions, and they confirmed a significant link. In particular, their results determined the salient role of attitude on the intentions to use compared to its effect on intentions to spread the word and the intentions to pay more. The same and similar findings are presented for the increased acceptance of high technologies in accommodation establishments [18,23].

2.5. Demographic Characteristics

Demographic characteristics have been constantly tested in relation to consumer behavior. Of these endeavors, many studies aimed to identify the moderating impact of gender and age in all aspects of individual behavior, which applies in the domain of technology-powered products/services [47–49].

The existing studies somewhat display a different perspective in regard to the customer behavior depending on age and gender. The studies indicated that the younger generations are tech-savvy, and they are more receptive of innovative technologies [48,50,51]. Nonetheless, there are few studies that discovered contradictory results. For example, Ivanov et al. [47] determined that customers below the age of 30 exhibited fewer positive attitudes than the higher aged customers group. Their findings indicated that the younger customers are skeptical towards excitement, memorability, and pleasure through human–robot interactions. With regard to the difference according to the gender group, males generally tend to embrace innovative technologies more than females [21,49,50]. Conversely, there are studies that empirically determined that females are more inclined towards technological advancements than males. For example, Ivanov et al. [48] confirmed that female customers are more positive towards service robots than male customers. On the other hand, Dinet and Vivian [21] determined that gender does not play a moderating role to shape individual perceptions towards innovative technology. Likewise, the extant literature suggests the necessity to investigate whether the age and gender disparity in the effect of the expected benefits on perceived value and attitude exists in the context of smart hotels.

2.6. Proposed Conceptual Model and Research Hypotheses

On the basis of a thorough review and discussion of the current literature, the proposed conceptual framework is depicted in Figure 1. Hypotheses 1–5 postulate the relationships among the study variables in the context of smart hotels. In addition, Hypotheses 6a–6h and Hypotheses 7a–7h were formulated in order to test the moderating effect of age and gender with the influence of the expected benefits on perceived value and attitude.

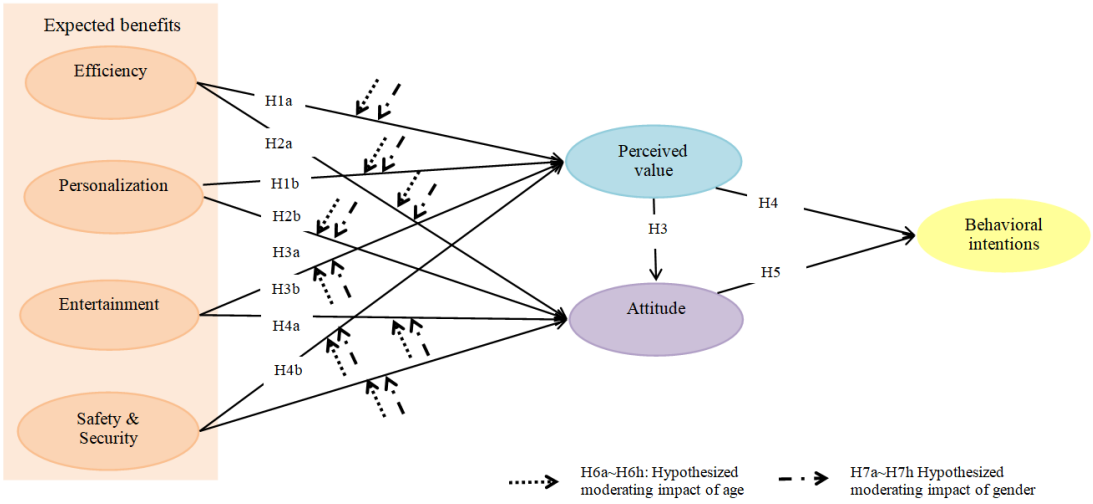

Figure 1. The proposed conceptual model.

Hypothesis 1a–1d (H1a–H1d). *Expected benefits towards a smart hotel increase perceived value.*
Hypothesis 2a–2d (H2a–H2d). *Expected benefits towards a smart hotel increase attitude.*
Hypothesis 3 (H3). *Perceived value increases attitude.*
Hypothesis 4 (H4). *Perceived value increases behavioral intentions.*
Hypothesis 5 (H5). *Attitude increases behavioral intentions.*
Hypothesis 6a–6h (H6a–H6h). *The age moderates the link between expected benefits towards a smart hotel and perceived value.*
Hypothesis 7a–7h (H7a–H7h). *The gender moderates the link between expected benefits towards a smart hotel and perceived value.*

3. Methodology

3.1. Measurement Items

All of the measurement items for the study constructs were borrowed from the current literature. More specifically, items for the expected benefits were adapted from Dabholkar and Bagozzi [29], Neuhofer et al. [8], and Tussyadiah et al. [19], and the items that were used for perceived value were cited from Kuo et al. [42]. The items that were used for attitude and behavioral intentions were borrowed from Ajzen [44] and Kim et al. [18]. All of the study variables except for attitude were measured using a 7-point Likert-scale which is known to better reflect respondents' accurate and true evaluation [52]. In the meantime, attitude was assessed using a semantic differential technique which a respondent rates the target on bipolar evaluative dimensions [53].

3.2. Data Collection

The data collection was conducted using an online survey company, Qualtrics which distributed the self-administrated questionnaires to its general panels in the United States. The company incentivizes survey respondents with a various type rewards such as gift cards and redeemable points, and this incentive system was helpful to encourage a truthful answer and genuine opinion. A screening question was used in order to limit the participants who have stayed at a hotel at least once in the past six months. Prior to the survey, the participants were provided with the definition of a smart hotel and a video, which is called "Go inside Alibaba's FlyZoo Future Hotel" [54] in order to visualize the concept and the customer experience at smart hotels. The outliers among the responses collected were removed, so this study used 270 responses for the statistical analysis as a result. This study employed SPSS 20 and AMOS 20 to validate data and test hypotheses through structural equation modeling analysis and multiple-group analysis.

Of the 270 respondents, 47.4% (n = 128) were males and 52.6% (n = 142) were females. The majority of the respondents (83.7%, n = 226) were Caucasian/White, and their mean age was 55.0 years old. With regard to the annual household income, 31.5% (n = 85) earned over USD 100,000, and 15.2% (n = 41) earned between USD 40,000 and 54,999. When the participants were asked about their level of education, 31.1% (n = 84) indicated that they hold four-year bachelor's degrees. In terms of their hotel stay experience, 57.0% (n = 154) stayed at hotels 2 to 5 times a year, and 15.2% (n = 41) stayed at hotels 6 to 10 times a year.

4. Data Analysis

4.1. Measurement Model

The confirmatory factor analysis (CFA) results of this study indicated that the model adequately fits the data (χ^2 = 523.235, df = 181, $p < 0.001$, χ^2/df = 2.891, CFI = 0.955, IFI = 0.955, NFI = 0.934, TLI = 0.943, RMSEA = 0.084). Table 1 exhibits the summary of the CFA results. Factor loadings were ranged from 0.876 to 0.965 and all are significant at $p < 0.001$. The calculation of composite reliability (CR) showed that all values were greater than the minimum threshold [55] and thus it confirmed a high degree of internal consistency for each variable. The convergent validity was established through the values of average variance extracted (AVE), which exceeded the recommended cutoff of 0.50 [56]. Furthermore, the discriminant validity was confirmed since AVE value for each variable

was generally found to be larger than the square of the correlation between each pair of constructs [57] (see Table 2).

Table 1. Summary of the confirmatory factor analysis.

Construct and Scale Item	Loadings	Mean	Standard Deviation
Expected Benefits			
Efficiency (AVE: 0.649; CR: 0.881)			
A smart hotel would enable me to enjoy products and services more efficiently.	0.906	4.2741	1.6938
A smart hotel would enable me to request and receive products/services without spending a lot of time.	0.908	4.5926	1.5511
A smart hotel would enable me to request and receive products/services without a lot of effort.	0.931	4.7037	1.5926
High-technology products and services employed at a smart hotel would improve the efficiency of my stay.	0.910	4.3926	1.7527
Personalization (AVE: 0.658; CR: 0.852)			
At a smart hotel, my own preference of the room arrangement, such as the view from the room and the view from the floor can be easily reflected through my profile in the system.	0.902	4.6815	1.5576
At a smart hotel, my own likes/dislikes, such as music during exercising or dining would be well recognized and adapted during the stay.	0.940	4.7185	1.5091
At a smart hotel, customized assistance would be available to improve my well-being, such as diet or exercise therapy based on my health condition.	0.876	4.6000	1.5650
Entertainment (AVE: 0.665; CR: 0.856)			
Using high-technology products and services provided at a smart hotel would be an enjoyable experience.	0.942	4.3333	1.7006
Advanced technologies and robots available at a smart hotel excite me to experience new things.	0.932	4.3296	1.8063
Interacting with advanced technologies and robots, such as an artificial intelligence (AI) reading a novel and chatting with robots that available at a smart hotel seems fun.	0.910	4.1926	1.7922
Safety and Security (AVE: 0.599; CR: 0.817)			
High technologies employed at a smart hotel, such as fire detection technology would provide a high level of safety.	0.914	4.5963	1.5485
High technologies employed at a smart hotel, such as door-lock by the facial recognition would provide a high level of security.	0.911	4.6444	1.5874
I would be immediately alerted and saved in case of any emergency at a smart hotel.	0.846	4.4222	1.6584
Perceived value (AVE: 0.619; CR: 0.829)			
A smart hotel would offer good value for the money I spend.	0.909	3.9148	1.6258
A smart hotel would provide a good deal compared to other hotels.	0.923	3.8593	1.6593
Staying at a smart hotel would be worth for me to sacrifice some time and efforts.	0.887	3.6222	1.7602
Attitude (AVE: 0.746; CR: 0.898)			
For me, staying at a smart hotel is . . .			
Bad-Good	0.954	6.3815	1.8531
Unfavorable-Favorable	0.965	6.1926	1.9048
Negative-Positive	0.945	6.3185	1.8818
Behavioral intentions (AVE: 0.638; CR: 0.841)			
I intend to visit a smart hotel in the future.	0.947	3.6926	1.8508
I plan to stay at a smart hotel in the future.	0.925	3.7519	1.8637
I am likely to recommend a smart hotel to others.	0.894	3.8481	1.7210
Goodness-of-fit statistics: χ^2 = 523.235, df = 181, $p < 0.001$, χ^2/df = 2.891, CFI = 0.955, IFI = 0.955, NFI = 0.934, TLI = 0.943, and RMSEA = 0.084			

Notes: CFI = Comparative Fit Index, IFI = Incremental Fit Index, NFI = Normed Fit Index, TLI = Tucker–Lewis Index, and RMSEA = Root Mean Square Error of Approximation.

Table 2. Descriptive statistics and associated measures.

Construct	Mean (SD)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Efficiency	4.4907 (1.5281)	0.881 [a]	0.754 [b]	0.781	0.673	0.658	0.704	0.675
(2) Personalization	4.2852 (1.6827)	0.569 [c]	0.852	0.763	0.736	0.688	0.686	0.675
(3) Entertainment	4.6667 (1.4457)	0.610	0.582	0.856	0.724	0.753	0.804	0.788
(4) Safety and Security	4.5543 (1.4813)	0.453	0.542	0.524	0.817	0.643	0.686	0.647
(5) Perceived value	3.7988 (1.5780)	0.433	0.473	0.567	0.413	0.829	0.758	0.770
(6) Attitude	6.2975 (1.8230)	0.496	0.471	0.646	0.471	0.575	0.898	0.836
(7) Behavioral intentions	3.7642 (1.7023)	0.456	0.456	0.621	0.419	0.593	0.699	0.841

Notes 1: SD = Standard Deviation. Notes 2: a. Composite reliabilities are along the diagonal; b. correlations are above the diagonal; and c. squared correlations are below the diagonal.

4.2. Structural Equation Model

This study performed structural equation modeling (SEM) in order to examine the relationships among the study variables. The results confirmed the appropriateness of the proposed model fit, which included χ^2 548.874, df = 186, $p < 0.001$, χ^2/df = 2.951, CFI = 0.952, IFI = 0.953, NFI = 0.930, TLI = 0.941, and RMSEA = 0.085. The results of the SEM determined that 7 out of 11 hypotheses were statistically accepted. These findings indicate the essential role of personalization and entertainment in forming the perception of value, as well as entertainment and safety/security in building a favorable attitude. Furthermore, the close associations among perceived value, attitude, and behavioral intentions were confirmed. Table 3 summarizes the results of the hypotheses test.

Table 3. Standardized parameter estimates for structural model.

	Path			Standardized Estimate	*t*-Value	Status
H1a	Efficiency	→	Perceived value	0.026	0.327	Not supported
H1b	Personalization	→	Perceived value	0.192	2.122 *	Supported
H1c	Entertainment	→	Perceived value	0.568	6.090 **	Supported
H1d	Safety and Security	→	Perceived value	0.075	0.968	Not supported
H2a	Efficiency	→	Attitude	0.096	1.443	Not supported
H2b	Personalization	→	Attitude	−0.068	−0.890	Not supported
H2c	Entertainment	→	Attitude	0.449	5.123 **	Supported
H2d	Safety and Security	→	Attitude	0.139	2.141 *	Supported
H3	Perceived value		Attitude	0.324	5.006 **	Supported
H4	Perceived value	→	Behavioral intentions	0.306	5.064 **	Supported
H5	Attitude	→	Behavioral intentions	0.631	10.335 **	Supported
χ^2 = 548.874, df = 186, $p < 0.001$, χ^2/df = 2.951, CFI = 0.952, IFI = 0.953, NFI = 0.930, TLI = 0.941, and RMSEA = 0.085						

Notes 1: * $p < 0.05$ and ** $p < 0.001$. Notes 2: CFI = Comparative Fit Index, IFI = Incremental Fit Index, NFI = Normed Fit Index, TLI = Tucker-Lewis Index, and RMSEA = Root Mean Square Error of Approximation.

4.3. Moderating Role of Age and Gender

This study conducted multiple-group analyses in order to identify the moderating effect of age, which is shown in Table 4. The respondents (n = 270) were divided into two groups according to their median value, which included a low age group (n = 132) and a high age group (n = 138). The results discovered that age moderated the relationship between entertainment and attitude, which supported H6g ($\Delta\chi^2 = 4.970 > \Delta\chi^2 = 0.5(1) = 3.84$ and df = 1). More concretely, the path coefficient between entertainment and attitude for the younger generation was 0.173 ($p > 0.05$), whereas the path coefficient for the older

generation was 0.643 ($p < 0.001$). There were no moderating effects of age in the other relationships except for the link between entertainment and attitude.

Table 4. The moderating role of age.

Path	Low Group (n = 132)		High Group (n = 138)		Unconstrained Model	Constrained Model
	β	t-Value	β	t-Value		
Personalization → Perceived value	0.231	1.406	0.285	2.350 *	χ^2 (378) = 934.973	χ^2 (379) = 934.973 [a]
Entertainment → Perceived value	0.375	2.640 *	0.587	4.268 **		χ^2 (379) = 935.653 [b]
Entertainment → Attitude	0.172	1.120	0.643	5.860 **		χ^2 (379) = 939.943 [c]
Safety and Security → Attitude	−0.017	−0.130	0.200	2.465 *		χ^2 (379) = 936.858 [d]
Chi-square difference test: [a] $\Delta\chi^2$ (1) = 0.000 and $p > 0.05$ (H6b is not supported) [b] $\Delta\chi^2$ (1) = 0.680 and $p > 0.05$ (H6c is not supported) [c] $\Delta\chi^2$ (1) = 4.970 and $p < 0.05$ (H6g is supported) [d] $\Delta\chi^2$ (1) = 1.886 and $p < 0.05$ (H6h is not supported)						
Goodness-of-fit statistics for the baseline model: χ^2 = 934.973, df = 378, $p < 0.001$, χ^2/df = 2.473, CFI = 0.929, IFI = 0.930, NFI = 0.887, TLI = 0.913, and RMSEA = 0.074						

Notes 1: * $p < 0.05$ and ** $p < 0.001$.

The same process was performed to test the moderating impact of gender, which is illustrated in Table 5. The respondents (n = 270) were divided into males (n = 128) and females (n = 142). Out of the four links, which demonstrated the effect of the expected benefits on perceived value and attitude, no moderating effect of gender existed. As a result, Hypothesis 7b, Hypothesis 7c, Hypothesis 7g, and Hypothesis 7h were not supported.

Table 5. The moderating role of gender.

Path	Male (n = 128)		Female (n = 142)		Unconstrained Model	Constrained Model
	β	t-Value	β	t-Value		
Personalization → Perceived value	0.311	1.939	0.157	1.470	χ^2 (378) = 1001.490	χ^2 (379) = 1002.018 [a]
Entertainment → Perceived value	0.702	3.900 **	0.492	4.657 **		χ^2 (379) = 1003.486 [b]
Entertainment → Attitude	0.559	3.579 **	0.384	3.543 **		χ^2 (379) = 1002.785 [c]
Safety and Security → Attitude	0.052	0.521	0.145	1.617		χ^2 (379) = 1002.176 [d]
Chi-square difference test: [a] $\Delta\chi^2$ (1) = 0.436 and $p > 0.05$ (H7b is not supported) [b] $\Delta\chi^2$ (1) = 1.997 and $p > 0.05$ (H7c is not supported) [c] $\Delta\chi^2$ (1) = 1.295 and $p > 0.05$ (H7g is not supported) [d] $\Delta\chi^2$ (1) = 0.686 and $p > 0.05$ (H7h is not supported)						
Goodness-of-fit statistics for the baseline model: χ^2 = 1001.490, df = 378, $p < 0.001$, χ^2/df = 2.649, CFI = 0.920, IFI = 0.921, NFI = 0.879, TLI = 0.903, and RMSEA = 0.078						

Notes 1: * $p < 0.05$ and ** $p < 0.001$.

5. Discussion and Implications

5.1. Discussion

The present study successfully examined the expected benefits towards smart hotels and their role in the formation of individual intentions. Scholars have stated exceptional experiences at smart hotels. For example, Xu [7] emphasized that smart hotels offer brand new intelligent experiences to customers, and these hotels consequently reinforce customer experiences. In this regard, this study supports the prior research by confirming that expected benefits, which are driven from the essential aspects of innovative technologies employed at smart hotels are important predictors of the customers' responses. This study

obtained results that concretely indicated that perceived value is affected by personalization and entertainment. These findings supported Hypothesis 1b and Hypothesis 1c, reaching the same conclusions as Foris et al. [28] and Lin et al. [35] about the importance of personalization and entertainment elements of smart hotels. Additionally, the results were consistent with studies [25] that suggested smart technologies empowered individuals to enjoy an interconnected and participatory consumption, which resulted in extraordinary value. Meanwhile, this study discovered that entertainment and safety/security influenced attitudes, thus confirming Hypothesis 2c and Hypothesis 2d. This is in line with studies that determined the meaningful role of entertainment to build individual attitude towards innovative technology-powered offerings [19], as well as studies that discussed a significant degree of safety and security as significant benefits regarding what customers perceive [9,36].

Contrary to our expectations, Hypothesis 1a and Hypothesis 2a, which posited the significant effect of efficiency on both perceived value and attitude, were not statistically supported. This outcome was somewhat different from the general findings from the existing studies, which dealt with efficiency as an essential benefit of adopting technology [2,27]. The findings of our study are probably due to efficiency being more related to the advantage of using a specific technology. This means that efficiency can be a core benefit toward a certain technology, such as a digital concierge and a voice control system at smart hotels, which probably exert a significant influence on value and attitude. However, it does not necessarily apply as benefits for the entire stay experience at smart hotels.

The results also confirmed Hypotheses 3–5 by finding a strong association among perceived value, attitude, and behavioral intentions, which are consistent with the general findings from the literature [40,41,45]. Furthermore, this outcome supports the framework of the value–attitude–behavior model. In other words, individual perceptions regarding the values from the offerings of smart hotels affect the development of attitude, which in turn increases the positive intentions towards smart hotels.

The moderating role of age was found only in the link between entertainment and attitude, i.e., Hypothesis 6g. To be specific, the effect of entertainment on attitude was stronger in the high age group than in the low age group. Younger generations are commonly familiar with various technology-mediated products/services [48,50], and they may not be impressed with the entertainment aspects regarding the cutting-edge technologies implemented at smart hotels. On the other hand, older generations may feel excited about using innovative technologies that are not available as traditional offerings from non-smart hotels. Thus, they perceived that entertainment is a substantial benefit of smart hotels, which consequently influenced their attitude. With respect to the gender difference, this study supported the results from Dinet and Vivian [21] with the confirmation of no moderating effect in the link between the expected benefits and perceived value and the association between expected benefits and attitude.

5.2. Theoretical Implications

A number of studies determined the expected benefits towards innovative technology from a customer's perspective, and they validated the importance of understanding the role of benefits in building customer responses. Hwang and Kim [11] asserted that service providers should make efforts to promote detailed benefits about what customers appreciate by using the services. However, the existing studies that pertain to the expected benefits towards smart hotels mainly deal with benefits from the suppliers standpoint [2,20]. Therefore, this study is worthy since it is among the first to examine customers' expected benefits towards smart hotels and their role in the development of future intentions. Furthermore, the moderating role of age and gender was empirically examined with regard to these relationships, and the results offer insights based on different outcomes, which are compared to the general findings in the current literature.

With the formation of customer behavior, the value–attitude–behavior approach has long been applied in the domain of technology-powered products/services [39,41].

In this respect, this study enriches the extant literature by providing appropriate empirical evidence regarding the value–attitude–behavior model in the context of smart hotels. In fact, this study is built on value, which is driven by the expected benefits, and it can thereby be considered as an extension of the value–attitude–behavior model. Hence, the present research contributes to validating the framework of the value–attitude–behavior model in a smart hotel context, and it also extends the conceptual model in order to predict the consumers' intentions better.

5.3. Managerial Implications

Based on the results, where both perceived value and attitude were affected by entertainment, the practitioners of smart hotels should illustrate how smart hotels improve an individual's emotional status. Novel experiences with fun elements should be visualized, so the potential customers perceive a high level of entertainment as a core benefit in while staying at smart hotels. Likewise, human–robot interactions should be described as interesting and enjoyable, and the marketing activities need to highlight these types of experiences. Smart hotels are distinguished from other hotels based on the high penetration of cutting-edge technologies, and hotels may therefore consider using advanced technologies, such as VR and AR for customers to visualize their future experiences at smart hotels. For instance, customers may experience staying at smart hotels in their imagination through VR, so they can be ensured of an entertaining experience, which would lead to enhanced value perceptions and a favorable attitudes. Moreover, the role of entertainment needs to be emphasized to the old generation group who are more influenced by this factor with the formation of attitude. Hence, the chances for senior travelers to try out novel technologies needs to be improved.

Previous studies have suggested the salient role of safety and security when customers select a hotel. Safety and security are regarded as factors that people find important more than ever since the onset of COVID-19 [6]. This study validated that consumers perceive a greater degree of safety and security at smart hotels, as well as the influence of safety and security on the development of individual attitudes toward a smart hotel. Thus, it is likely that people would appreciate smart hotels more in a pandemic environment, and hotel professionals should maximize their resources in order to enhance the safety and security standards. There are many hotels that have recently adopted innovative technologies due to a growing interest in contactless services [36]. Therefore, smart hotels should take the lead to showcase the flawless operations regarding their safety and security.

6. Limitations and Future Research

This study focused on the benefits that consumers expect regarding a smart hotel. Even though the studies discussed many benefits with the adoption of innovative technologies, there are considerable amounts of skepticism and worries that individuals exhibited [17]. Thus, it is suggested that future studies should investigate the barriers and risks associated with smart hotels, which would be helpful to comprehensively predict consumer behavior in the context of smart hotels. Second, this study considered age and gender as important moderators; future studies should test the moderating effect of other demographic characteristics. In addition, various situational factors play an important moderating role in the development of the individuals' acceptance behavior, which applies in the area of technology adoption [29,45]. Likewise, it is recommended for the scholars to take situational factors into consideration in order to examine the consumer behavior regarding smart hotels.

7. Conclusions

Smart solutions based on innovative technologies provide unprecedented opportunities for the hotel industry [8]. Moreover, the dependency on advanced technologies has increased due to the current circumstances during the pandemic [6]. The present study focused on smart hotels, which can offer innovative solutions for the future of hotels. We en-

deavored to examine customers' expected benefits and their roles in the development of future intentions. More specifically, this study was conducted for the purpose of investigating the relationships between expected benefits, perceived value, attitude, and behavioral intentions in consideration of the moderating role of age and gender. Our findings, which were based on a quantitative approach, exhibited a significant effect of personalization and entertainment in the development of perceived value, as well as entertainment and safety/security in the formation of attitudes. The moderating effect of age was found as a link between entertainment and attitude, whereas no moderating effect of gender was identified. Furthermore, the close associations among perceived value, attitude, and behavioral intentions were confirmed. Based on this empirical evidence, this study offers a deeper comprehension of customers' intentions towards a smart hotel and will be helpful for hotel practitioners to establish effective strategies in order to improve their market share in the hotel industry.

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