

The Relationship Between Service Automation, Service Quality and Hotel Brand Image in Egypt's Hotel Chains: Guests' Perspective

العلاقة بين أتمتة الخدمة وجودة الخدمة وصورة العلامة التجارية في سلاسل الفنادق في مصر من منظور النزلاء

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Abstract

المستخلص

It is the goal of hoteliers to provide innovative and personalized products and services to their guests. As a result, hotels provide a wide range of services to their guests. The latest technology is used to ensure guest satisfaction. The purpose of service automation is to enhance the quality of service. Therefore, the primary aim of this research is to explore guests' perspectives regarding the relationship between service automation (SA), service quality (SQ) and hotel brand image (HBI) in the context of hotel chains in Egypt. The convenient sample consisted of guests who stayed at hotel chains in Egypt during the last three years. A total of 262 guests were surveyed online for this research. The analysis was conducted using SPSS software. The findings of this research indicate that service automation has no significant impact on the brand image of hotel chains. In spite of this, the quality of a hotel's service contributes to its image. Also, service automation has a significant positive impact on service quality. A discussion of some limitations and future research is also provided.

هدف أساسي لأصحاب الفنادق هو تقديم منتجات وخدمات مبتكرة لضيوفهم ، نتيجة لذلك ، تقدم الفنادق مجموعة واسعة من الخدمات لنزلائها ، ويتم استخدام أحدث التقنيات لضمان رضا النزلاء ، والغرض من أتمتة الخدمات هو تحسين جودة الخدمات المقدمة داخل هذه الفنادق ، لذا ، فإن الهدف الأساسي لهذه الدراسة هو اكتشاف وجهات نظر النزلاء فيما يتعلق بالعلاقة بين أتمتة الخدمة وجودة الخدمة وصورة العلامة التجارية في نطاق سلاسل الفنادق في مصر ، العينة الملائمة للدراسة تكونت من النزلاء الذين أقاموا في سلاسل الفنادق في مصر خلال آخر ثلاث سنوات ، تم استبيان عدد ٢٦٢ نزيل عبر الإنترنت لهذه الدراسة ، كما تم إجراء التحليل باستخدام برنامج SPSS ، و في ضوء النتائج ، تم اكتشاف أنه لا يوجد تأثير لأتمتة الخدمة على صورة العلامة التجارية لسلاسل الفنادق ، ومع ذلك ، فإن أتمتة الخدمة لها تأثير إيجابي للغاية على جودة الخدمة ، وأيضا تؤثر جودة الخدمة إيجابيا على صورة العلامة التجارية ، كما تم مناقشة بعض القيود وبعض التوصيات لأبحاث مستقبلية.

Keywords: Service Automation; Robots, Artificial Intelligence; Service Quality; Hotel Brand Image.

الكلمات الدالة: أتمتة الخدمة؛ الروبوتات؛ الذكاء الاصطناعي؛ جودة الخدمة؛ صورة العلامة التجارية.

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Introduction

A highly competitive sector, Egypt's hospitality sector is one of the most significant economic sectors in the current economic climate (Tong-On, Siripipatthanakul and Phayaphrom, 2021). The COVID-19 outbreak has a direct impact on Egypt's tourism industry. The COVID-19 pandemic has negatively affected hoteliers in the Egyptian market. Foreign visitors have canceled their travel plans, and flight restrictions have been imposed in order to protect the public health. Due to these difficult economic times, the hotel industry has a difficult time surviving (Bhrammanachote & Sawangdee, 2021 ; Siripipatthanakul, 2021).

It is extremely valuable for hotels to have a competitive edge in a highly competitive market. In addition, it is important for them to gain the confidence of their customers in order to achieve a competitive advantage. Providing high-quality services to customers is the key to a hotel's success in today's highly competitive environment (Al-Ababneh, Masadeh, Al-Shakhsheer and Habiballah, 2018). By automating the service process, a hotel can offer a high standard of service to both internal and external customers, while remaining competitive in the (Narangajavana & Hu, 2008 ; Banerjee & Sah, 2012 ; Al-Shami, Al-Hammadi, Hammadi and et al., 2021 ; Bo & Gottfridsson, 2021).

Travel, hospitality, and tourism businesses increasingly rely on robotics, artificial intelligence, and service automation (RAISA) technologies, including delivery robots, robotic concierges, conveyor restaurants, and self-service kiosks. While considerable progress has been made in the field of social robotics, few studies have been conducted on service automation within the tourism and hospitality industries (Ivanov & Webster, 2017 ; Parvez, Ozturen and Cobanoglu, 2020 ; Ali, Gardi, Othman and et al., 2021 ; Li, Yin, Qiu and Bai, 2022). As a result of this research, a gap is partially filled.

Review of Literature

Service Automation (SA) and Hotels Industry

Automated systems are machines or groups of machines that follow a predetermined or programmable sequence of actions (Collier, 1983). Furthermore, automation refers to the process of utilizing machinery in order to complete a particular task “*predetermined or reprogrammable sequence of tasks*” in the service delivery (Ivanov, Webster and Berezina, 2017 , p.11). Automated teller machines (ATMs), conveyors, self-checkout machines, and vending machines were all early examples of service automation. In order to improve customer experience and service efficiency, information and communication technologies will continue to be improved (Law, Buhalis and Cobanoglu, 2014).

According to tourism scholars, automation will transcend tourism literature's theories and will enter into current tourism practices so as to replace labor-intensive tourism with an automated industry of the future (Tussyadiah, 2020). Since robots cannot be affected by viruses and can perform tasks efficiently and quickly, what employees wish to ignore or escape can be accomplished by robots. Automation was influenced by the complexity of the present COVID-19 situation to operate the robot broadly and intelligently to accomplish the tasks through a machine, where the program is installed, and an employee supervises its operation (Kim, Kim, Badu-Baiden and et al., 2021).

As a result of robotics, artificial intelligence, and service automation (RAISA), the hospitality industry is seeking new technologies that will allow them to offer their guests extraordinary services (Lukanova & Ilieva, 2019 ; Al-shami et al., 2021). As part of RAISA's innovative approach, the travel, tourism, and hospitality industries were introduced to innovative ways of improving procedures, escalation efficiency, and ensuring quality levels were maintained at a constant level (Haynes, 2020). Machines with automated functions have been widely used in the manufacturing industry; however,

recently, these technologies have been adopted by the hospitality industry to redesign the level of service. Additionally, “*automated robots in the service is the foundation of self-service technologies through which part of the process of producing and delivering the service is transferred to the customer, Self-service technologies can be defined as a service delivery method, which allows the customer to become a producer / co-producer of the service without the need for mediation of service staff*” (Lukanova & Ilieva, 2019 , p.3). Service robots are perceived as providing safety, saving time, costs, and energy, in addition to improving operations skills and quality (Christou, Simillidou and Stylianou, 2020).

Service Automation (SA) and Guest Life Cycle

The literature review of the RAISA in Hospitality suggests that their implementation in service delivery could be tailored to fit specific needs. According to below table, some basic examples of RAISA application in hotel companies are presented that define the scope of the research presented.

Table (1): Examples of RAISA Application in Hotels

Automation Service /	SA	AI	Robots
Guest Life Cycle			
Pre- Arrival	Virtual Reality	AI Search Platform	
	Mobile check-in	Chatbots	
Arrival	Digital kiosks / Smartphone		Porter Robots
	Room Keys/Non-stop check-in		
During Stay	In-room smart technologies	Interactive	Front desk robots
		Social	Concierge robots
		Hubs	Delivery robots
		Chatbots	Vacuum cleaning robots
			Room assistant robots
Departure	Express Checkout kiosks	Digital Travel assistant	Porter robots
Assessment		AI platform	

Source: (Lukanova & Ilieva, 2019)

A potential customer undertakes two main operations during the Pre-Arrival phase - gathering information and making reservations (Lukanova, 2014). In the initial stages of researching a destination, a prospective customer is looking for information about the accommodation options available. A comparison is made between different hotel types, services, amenities, and prices. A customer selects a hotel based on the collected information and makes a reservation, i.e. purchases a hotel room. Therefore, it is critical for a hotel at this point to be as visible to potential guests as possible (Howell & Hadwick, 2017 ; Jabeen et al., 2021). Technology such as mobile technology, virtual reality, and virtual assistants are highly effective marketing tools in the hospitality industry for increasing customer loyalty, improving customer interactions, and enhancing customer satisfaction. (Wang & Fesenmaier, 2013 ; Dickinson, Ghali, Cherrett and et al., 2014 ; Howell & Hadwick, 2017)

The second stage of the guest cycle involves welcoming the guest, registering him or her, and assigning a room to him or her. The hospitality industry has increasingly embraced innovative

technologies such as digital kiosks, mobile check-ins, and smartphone room keys to benefit guests upon their arrival and to save them time and frustration (Beatson, 2010).

During the occupancy stage, various services are provided to guests and a variety of operations are performed, thereby providing a variety of opportunities for RAISA's implementation and application. A unique and memorable experience cannot be achieved simply by providing high speed internet, a smart TV and digital entertainment devices (Bartelds, 2014). The hospitality industry should therefore continue to develop RAISA at all levels of operational performance in order to improve the user experience. This includes both front office operations that are visible to the customer and are conducted with or without his involvement, as well as back office operations, which are carried out outside of the customer's view. (Margarido, 2015 ; Lukanova & Ilieva, 2019).

It is during the Departure stage that the guest's bill is paid, the room is vacated, and the guest checks out. By automating service processes, hotel guests are able to save time and effort, which reinforces their positive impressions of the hotel and enhances their guest experience. (Kim & Qu 2014 ; Berezina, 2015 ; Hertzfeld, 2019).

After the guest leaves the hotel, the Assessment stage is conducted. Here, guests are given the opportunity to share their opinions regarding their stay at the hotel (Barreda & Bilgihan, 2013). With today's technology, guests are able to share information and provide feedback through a variety of channels (Neuhofner, Buhalis and Ladkin, 2012). Additionally, at this stage, the hotel has the opportunity to understand the preferences and opinions of its guests, to use the gathered information to turn these guests into loyal customers (Berezina, 2015).

Service Quality (SQ)

Parasuraman, Valarie and Leonard, (1985) Service quality may be defined as a comparison between what consumers perceive as service and what they desire as service. If the service received or felt aligns with expectations, then the service quality is deemed acceptable. If the service exceeded the consumer's expectations, the service quality is considered very positive. On the other hand, if the service received is less than expected, then it is considered to be of poor quality.

As defined by Parasuraman, Zeithaml and Berry, (2002), service quality is the difference between customers' expectations and perceptions of the service experience. Further, in-depth interviews were conducted with banks, credit card companies, product maintenance companies, long-distance carriers, and their customers as part of the empirical research to construct the SERVQUAL scale, which consists of five dimensions (tangible, reliable, responsiveness, assurance, and empathy) and 22 items. The perception of service quality in restaurants, however, is based on the customers' evaluation of their dining experiences and the expectations they have regarding their dining experience (Marković, Raspor and Šegarić, 2010). Customer satisfaction is strongly influenced by the quality of restaurant service (Kim et al., 2009 ; Ladhari et al., 2008).

In order to meet customer expectations, service providers must provide a higher level of quality (Akbaba, 2006 ; He & Li, 2011; Hemsley-Brown & Alnawas, 2016). Mohsin and Lockyer (2010) Their expectations are continuously compared with the actual performance of the service providers. As a result, service quality encompasses both the process as well as the results of service delivery. In other words, the evaluation of service quality is based on the interaction between customer and employee (i.e., the process aspect), the environment of the service, and the outcome of the service (Brady & Cronin, 2001). In the increasingly competitive hospitality industry, it has been demonstrated that providing high quality service is essential in order to retain customers. As a result, it is often monitored in order to improve customer loyalty (Camilleri, 2019).

The provision of excellent service in the hospitality sector can have a positive impact on customer satisfaction, corporate image, and ultimately consumer retention (Hu et al., 2009 ; Mohsin & Lockyer, 2010). On the other hand, hotels that provide insufficient service quality may experience contentious issues such as negative customer feedback, which is often conveyed through online reviews (Akbaba, 2006 ; Dedeoğlu & Demirel, 2015). For this reason, hotel managers should be able to identify both tangible and intangible aspects that need to be improved if they are to enhance the satisfaction of their guests at all levels of service (Rauch et al., 2015 ; Alharbi, 2018) ; Irama & Abror, 2019 ; Dam & Dam, 2021).

Hotels Brand Image (HBI)

There has been some evidence in the past that brand image is related to customer satisfaction (Wu, Liao, Chen and Hsu, 2011 ; Anwar, Min and Dastagir, 2019). In addition, prior studies have demonstrated that brand perception is a predictor of customer satisfaction and has a positive impact on customer satisfaction (Wu et al., 2011 ; Anwar et al., 2019). Some previous studies have also suggested that brand image and customer loyalty are related (Tu, Wang and Chang, 2012 ; Hsieh, Lu and Lu, 2018 ; Anwar et al., 2019). Besides, some previous empirical outcomes have explained that a Customer loyalty will be influenced by a favorable image (e.g., brand, shop, retail) (Tu et al., 2012 ; Hsieh et al., 2018)(Hsieh et al., 2018)(Hsieh et al., 2018) ; Anwar et al., 2019).

Branding is an efficient tool for companies to identify and differentiate their products or services from those of their competitors. In order to enhance the performance of a business, branding is a widely used marketing strategy (Hsu, Oh and Assaf, 2012 ; Liu, Chu, Wong and et al, 2012 ; Mizik, 2014). According to literature, the primary objective of any business should be to build a strong brand (Keller, 2008 ; O’Cass & Weerawardena, 2010 ; Mandil, 2016). There is no difference between the terms brand image and brand association (Hsu et al., 2012). An association between a brand and a consumer's memory is known as a brand association (Romaniuk & Nenycz-Thiel, 2013). In many cases, consumers make their purchasing decisions based on their perceptions of the brand image of a company (Kim & Kim, 2005). Strong brand image is positively related to consumers' willingness to pay more for a product or service (Keller, 1993 ; Cretu & Brodie, 2007). It is believed that a unique brand image differentiates a company from its competitors and gains a certain position in a consumer's mind, thereby contributing to the potential enhancement of the company's brand equity (Sondoh, Omar and Wahid, 2007 ; Surjaatmadja, Hubaib and Muda, 2019). According to the cognitive perspective, the brand image is reflected in the resources associated with the functional features that attract tourists (Horng, Liu, Chiu and Tsai, 2012). As a result of a positive image of a brand, consumers are likely to associate the brand with benefits and high expectations of quality (Hyun & Kim, 2011).

Research Aim and Objectives

Due to the identified gaps in the literature and the relevant studies, the primary objective of this research is to explore the perspectives of guests regarding the relationship between service automation, service quality, and hotel brand image in Egypt's hotel chains based on the highlighted gaps in the literature.

Conceptual Framework and Hypotheses Development

As an independent variable, service automation may affect service quality and hotel brand image as a dependent variable. In contrast, service quality as an independent variable may influence hotel brand image as a dependent variable. Below diagrams illustrating these relationships and hypotheses that have been developed:

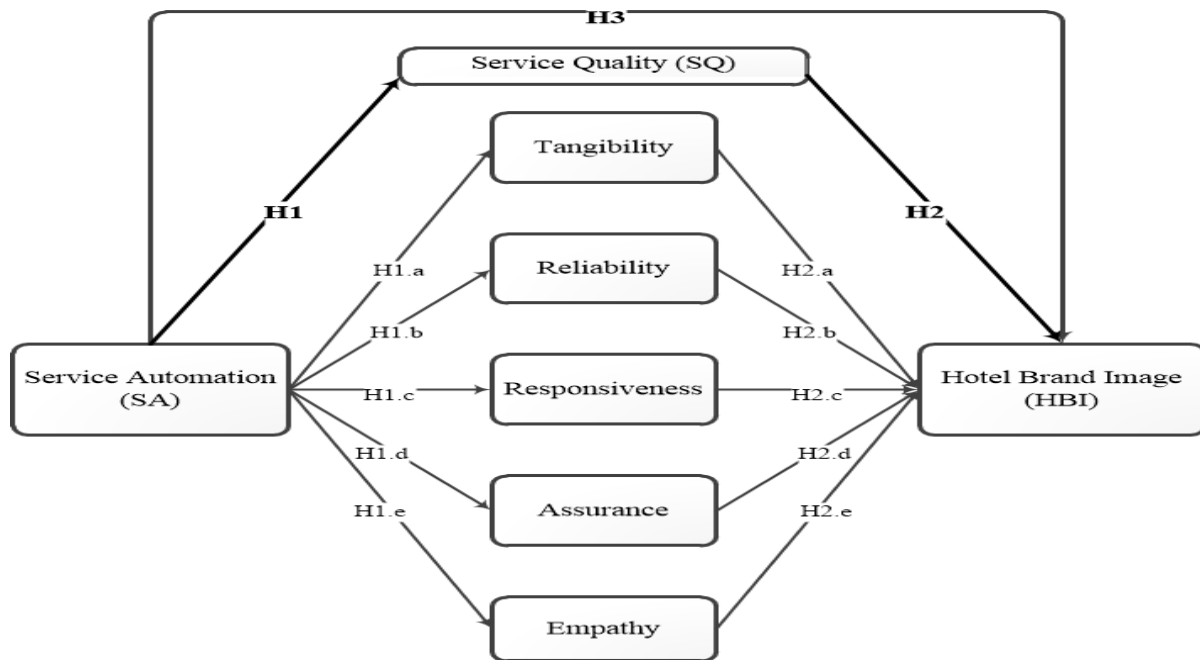


Figure (1) : Conceptual framework of the research.
Source: Adopted by The Researcher (Designed by Visio 2016).

H1: Service automation has a direct positive significant effect on service quality.

H1. a: Service automation has a direct positive significant effect on Tangibility.

H1. b: Service automation has a direct positive significant effect on Reliability.

H1. c: Service automation has a direct positive significant effect on Responsiveness.

H1. d: Service automation has a direct positive significant effect on Assurance

H1. e: Service automation has a direct positive significant effect on Empathy

H2: Service quality has a direct positive significant effect on hotel brand image.

H2. a: Tangibility has a direct positive significant effect on hotel brand image.

H2. b: Reliability has a direct positive significant effect on hotel brand image.

H2. c: Responsiveness has a direct positive significant effect on hotel brand image.

H2. d: Assurance has a direct positive significant effect on hotel brand image.

H2. e: Empathy has a direct positive significant effect on hotel brand image.

H3: Service automation has a direct positive significant effect on hotel brand image.

Methodology

The relationship between service automation, service quality, and hotel brand image is examined. A systematically defined research methodology was presented, which utilized a step-by-step approach in gathering data in order to explain the research methodology. In this field of research, positivism is widely accepted as an imperative component. The empirical research is conducted using a quantitative methodology. An online survey on Google forms was justified as a method of collecting data using social media channels. The questionnaire included four main sections; the first section was a general overview covering the key sampling characteristics of participants. The second section

collects responses regarding the experience of the service automation. The third section focused on data pertaining to service quality (responsiveness, tangibles, reliability, assurance, and empathy). The fourth section contained responses related to hotel brand image. A questionnaire was developed based on the researcher's research hypotheses and guidelines considered crucial in generating optimal final response rates.

The research population in this research consists of all guests who have stayed in hotel chains in Egypt over the past three years. It is not possible to determine the exact size of the hotel chain's guest population. The research depended on the convenience sample in the field research. Most research studies require samples larger than 30 and smaller than 500 (Roscoe, 1975). Pilot study of 20 respondents been used to test validity of the survey. There were only a total of (262) respondents to the guests' survey in this research been collected.

Validity of the Research

Validity refers to whether the constructs that are being measured accurately represent the concept of interest. As a result of scale validity, a scale can be guaranteed to be unidimensional, to conform to its conceptual meaning, and to achieve the level of reliability required (Hair et al., 2010). Based on corrected item-total correlations, it has been determined that all items have a value between 0.35 (35%), 0.85 (85%), and therefore construct validity exists (Sekaran & Bougie, 2016).

Reliability of the Research

The Cronbach alpha coefficient is commonly used to evaluate the reliability of measurement scales that contain multiple components (Winch, 1999). It is a measure of the degree of homogeneity within the reviewed items that Cronbach's alpha coefficient ranges from 0 to 1. It is considered extremely reliable if the Cronbach alpha value exceeds 0.70 (Hair et al., 2010). In this research, Cronbach's alpha coefficient was used to determine the constructs' reliability, and the threshold for assessment was established at 0.70.

Table (2): Reliability Assessment

Variable	Cronbach's Alpha	No. of Items
Service Automation	0.930	10
Tangibility	0.834	3
Reliability	0.953	6
Responsiveness	0.958	4
Assurance	0.940	3
Empathy	0.952	3
Hotel Brand Image	0.975	7

Results and Discussion

This research gathered the data from hotel chains guests between June, 2022 and August, 2022. The present research gathered a total of 262 responses from guests using online surveys which were valid for further analysis. The demographic profiles of the 262 respondents are specified below.

Sample Characteristic

It is possible to numerically describe data sets using descriptive statistics by using two elements; the central tendency theory and the dispersion theory (Saunders et al., 2009). Pallant (2020) It is recommended that in studies involving human participants, demographic information, including gender, age, educational level, and any other relevant information, should be reported.

Table below (3) shows that 78.6% of the sample gathered was males and 21.4% were females.

Table below (3) shows the age distribution of respondents. Among the respondents, 50.8% were between the ages of 18 and 28, 28.6% between the ages of 29 and 39, 10.7% were between the ages of 18 and 19, and 9.9% were between the ages of 40 and 50.

Moreover, table below (3) presents the respondent's educational level. Approximately 54.6% of the respondents have a high school education, 29.4% have a university degree, and 16.0% have a basic education, according to the figures.

Table (3) presents the location of the chain. Based on the figures, 68.3% of respondents stayed with a local, national, or global chain, while 31.7% stayed with a global chain.

Table (3) presents the hotel location area. According to the survey results, 32.8 percent of respondents stay at hotels in Hurghada and the Red Sea region, 22.9% of respondents stay at hotels in Cairo, 22.9% stay at hotels in other areas, 18.3% stay at hotels in Sharm El Sheikh and 3.1 stay at hotels in Luxor and Aswan.

Table (3): Sample Characteristic Analysis

Sample Characteristic	Frequency	Percent
Gender		
Male	206	78.6
Female	56	21.4
Total	262	100.0
Age		
less than 18	28	10.7
19 - 28	133	50.8
29 - 39	75	28.6
40 - 50	26	9.9
Total	262	100.0
Education		
Basic Education	42	16.0
High school	143	54.6
University degree	77	29.4
Total	262	100.0
Chain Classification		
Local or National chain	179	68.3
Global chain	83	31.7
Total	262	100.0
Hotel Location		
Cairo	60	22.9
Sharm El Sheikh	48	18.3
Hurghada & Red Sea	86	32.8
Luxor & Aswan	8	3.1
Other	60	22.9
Total	262	100.0

Descriptive Statistics

The purpose of this section is to introduce descriptive statistics for the research variables. Based on a five point Likert scale, (1) represents 'strongly disagree' or 'very desired' in relation to the service automation variable, while (5) represents 'strongly agree' or 'undesired at all'.

The mean score for all 3 variables is as follows: service automation is between 2.42 and 3.34, service quality (tangibility) is between 3.27 and 4.05, service quality (reliability) is between 3.45 and 3.85, service quality (responsiveness) is between 3.37 and 3.56, service quality (assurance) is between 3.44

and 3.58, service quality (empathy) is between 3.53 and 3.61, and hotel brand image is between 3.32 and 3.76.

In the case of items of the service automation variable, the mean is (2), which is less than the point of neutrality, which shows that most respondents are unsatisfied with the item of the service automation variable. For the items of the service quality variable, the mean is greater than (3), which is higher than the point of neutrality, indicating that most respondents agree with the items and the figures. The hotel brand image variable has a mean greater than (3), which is higher than the point of neutrality, indicating that most respondents agree with the items.

Table (4): Summary of Variables Statistics

Items	Mean	Minimum	Maximum	Std. Deviation	No. of Items
Service Automation	2.840	2.420	3.344	1.314	10
Tangability	3.578	3.271	4.050	1.255	3
Reliability	3.538	3.450	3.847	1.304	6
Responsiveness	3.443	3.370	3.557	1.309	4
Assurance	3.527	3.435	3.576	1.289	3
Empathy	3.561	3.527	3.607	1.311	3
Hotel Brand Image	3.546	3.317	3.760	1.301	7

Correlation

The correlation coefficient measures the strength of the linear relationship between variables. As illustrated in the following table, Pearson correlation was used to determine the association between the variables of the research framework. From 0.10 to 0.29, correlation coefficients are considered weak; from 0.30 to 0.49, they are considered medium; and from 0.50 to 1.0, they are considered strong. (Cohen, 2013). The table below shows the correlation matrix with the Pearson correlation coefficient as well as the associated test results for determining its significance. As a result of these results, linear associations were established between the variables of the research.

Table (5): Correlation

Variable		Service Automation	Tangibility	Reliability	Responsiveness	Assurance	Empathy	Hotel Brand Image
Service automation	Pearson Correlation	1	.646**	.688**	.683**	.657**	.664**	.659**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000
Tangibility	Pearson Correlation	.646**	1	.858**	.833**	.814**	.818**	.804**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000
Reliability	Pearson Correlation	.688**	.858**	1	.911**	.874**	.860**	.872**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000
Responsiveness	Pearson Correlation	.683**	.833**	.911**	1	.912**	.890**	.857**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000
Assurance	Pearson Correlation	.657**	.814**	.874**	.912**	1	.882**	.865**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000

Empathy	Pearson Correlation	.664**	.818**	.860**	.890**	.882**	1	.879**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000
Hotel Image	Pearson Correlation	.659**	.804**	.872**	.857**	.865**	.879**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Hypotheses Testing

In order to test the hypotheses (**H1. a**) below, simple linear regression was used. It is evident from the below table that service automation is responsible for 41.7% (R squared=0.417) of the variance in tangibility.

Table (6): R Square Coefficient of Tangibility

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics
					R Square Change
					F Change
					Sig. F Change
1	.646a	0.417	0.415	0.95971	0.417
					186.273
					0.000

a. Predictors: (Constant), Service Automation

From below table, it is revealed that the independent variables (service automation) have significant effect on the dependent variable (tangibility) where $F=186.3$, $DF(1, 260)$ and significance= 0.000, is less than 1% so, the hypothesis is rejected, and the effect is significant.

Table (7): Significance of Impact SA on Tangibility by ANOVA

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	171.564	1	171.564	186.273	.000b
	Residual	239.469	260	0.921		
	Total	411.033	261			

a. Dependent Variable: Tangibility

b. Predictors: (Constant), Service Automation

Below table presents the value explained by each independent variable (β). It is clear that SA is significantly and positively affecting tangibility ($\beta=0.617$, $p<0.01$).

H1. a: Service automation has a direct positive significant effect on Tangibility is supported.

Table (8): Simple Linear Regression analysis of Tangibility

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.825	0.141		12.907	0.000
	Service Automation	0.617	0.045	0.646	13.648	0.000

a. Dependent Variable: Tangibility

We performed Simple Linear Regression in order to test the hypotheses (H1. b) below. As can be seen from the table below, service automation variable is responsible for 47.3% (R squared=0.473) of the variance in reliability.

Table (9) : R Square Coefficient of Reliability

Model Summary							
Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Change Statistics	R Square Change	F Change
1	.688 ^a	0.473	0.471	0.94822		0.473	233.679

a. Predictors: (Constant), Service Automation

From below table, it is revealed that the independent variables (Service Automation) have significant effect on the dependent variable (reliability) where $F=233.68$, $DF(1, 260)$ and significance is less than 1% so, the hypothesis is rejected, and the effect is significant.

Table (10): Significance of Impact SA on Reliability by ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	210.108	1	210.108	233.679	.000 ^b
	Residual	233.773	260	0.899		
	Total	443.881	261			

a. Dependent Variable: Reliability

b. Predictors: (Constant), Service Automation

Below table presents the value explained by each independent variable (β). It is clear that SA is significantly and positively affecting reliability ($\beta=0.683$, $p<0.01$).

H1. b: Service automation has a direct positive significant effect on reliability is supported.

Table (11): Simple Linear Regression analysis of Reliability

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.598	0.140		11.439	0.000
	Service Automation	0.683	0.045	0.688	15.287	0.000

a. Dependent Variable: Reliability

For the purpose of testing the hypotheses (H1.c) below, we used simple linear regression. The table below indicates that the service automation variable is responsible for 46.7% (R squared = 0.467) of the variance in responsiveness.

Table (12): R Square Coefficient of Reliability

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.683 ^a	0.467	0.465	0.95816	0.467	227.451	0.000

a. Predictors: (Constant), Service Automation

From below table, it is revealed that the independent variables (Service Automation) have significant effect on the dependent variable (responsiveness) where $F=227.45$, $DF(1, 260)$ and significance is less than 1% so, the hypothesis is rejected, and the effect is significant.

Table (13): Significance of Impact SA on Responsiveness by ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	208.817	1	208.817	227.451	.000 ^b
	Residual	238.699	260	0.918		
	Total	447.516	261			

a. Dependent Variable: Responsiveness

b. Predictors: (Constant), Service Automation

Below table presents the value explained by each independent variable (β). It is clear that SA is significantly and positively affecting responsiveness ($\beta=0.681$, $p<0.01$).

H1.c: Service automation has a direct positive significant effect on Responsiveness is supported.

Table (14): Simple Linear Regression analysis of Responsiveness

Coefficients ^a						
Model		Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
		B		Beta		
1	(Constant)	1.510	0.141		10.692	0.000
	Service Automation	0.681	0.045	0.683	15.081	0.000

a. Dependent Variable: Responsiveness

As a method of testing the hypotheses (**H1. d**) below, we used simple linear regression. A large proportion of the variance in assurance can be attributed to the service automation variable ($R^2 = 0.431$), as shown in the table below.

Table (15): R Square Coefficient of Assurance

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1							

1	.657 ^a	0.431	0.429	0.97388	0.431	197.341	0.000
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a. Predictors: (Constant), Service Automation

From below table, it is revealed that the independent variables (Service Automation) have significant effect on the dependent variable (assurance) where $F=197.34$, $DF(1, 260)$ and significance is less than 1% so, the hypothesis is rejected, and the effect is significant.

Table (16): Significance of Impact SA on Assurance ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	187.165	1	187.165	197.341	.000 ^b
	Residual	246.593	260	0.948		
	Total	433.757	261			

a. Dependent Variable: Assurance

b. Predictors: (Constant), Service Automation

Below table presents the value explained by each independent variable (β). It is clear that SA is significantly and positively affecting assurance ($\beta=0.644$, $p<0.01$).

H1. d: Service automation has a direct positive significant effect on Assurance is supported

Table (17): Simple Linear Regression analysis of Assurance

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.696	0.144		11.822	0.000
	Service Automation	0.644	0.046	0.657	14.048	0.000

a. Dependent Variable: Assurance

We used simple linear regression to test the hypotheses (**H1. e**) below. The table below illustrates how a large percentage of empathy variance can be attributed to the service automation variable ($R^2 = 0.442$).

Table (18): R Square Coefficient of Empathy

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.664 ^a	0.442	0.439	0.98130	0.442	205.551	0.000

a. Predictors: (Constant), Service Automation

From below table, it is revealed that the independent variables (Service Automation) have significant effect on the dependent variable (empathy) where $F=205.55$, $DF(1, 260)$ and significance is less than 1% so, the hypothesis is rejected, and the effect is significant.

Table (19): Significance of Impact SA on Responsiveness by ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	197.935	1	197.935	205.551	.000 ^b
	Residual	250.366	260	0.963		
	Total	448.301	261			
a. Dependent Variable: Emphy						
b. Predictors: (Constant), Service Automation						

Below table presents the value explained by each independent variable (β). It is clear that SA is significantly and positively affecting empathy ($\beta=0.663$, $p<0.01$).

H1. e: Service automation has a direct positive significant effect on empathy is supported

Table (20): Simple Linear Regression analysis of Empathy

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.679	0.145		11.611	0.000
	Service Automation	0.663	0.046	0.664	14.337	0.000
a. Dependent Variable: Emphy						

To test the following hypotheses, multiple linear regression was employed. It can be seen from the following table that the factors of service automation, tangibility, reliability, responsiveness, assurance, and empathy account for 83.5% (R square = 0.835) of the variance in hotel brand image.

Table (21): R Square Coefficient

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig. F Change
1	.914 ^a	0.835	0.831	0.53524	0.835	214.639	0.000
a. Predictors: (Constant), service automation, tangibility, reliability, responsiveness, assurance and empathy							

As shown in the following table, the independent variables (service automation, tangibility, reliability, responsiveness, assurance and empathy) have significant effects on the dependent variable (hotel brand image), with $F=214.64$, $DF(6, 255)$ and significance less than 1%. Thus, the hypothesis has been rejected, and the effect has been demonstrated to be significant.

Table (22) : ANOVA Coefficient

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	368.945	6	61.491	214.639	.000 ^b

Residual	73.054	255	0.286
Total	441.998	261	

a. Dependent Variable: Hotel Brand Image

b. Predictors: (Constant), service automation, tangibility, reliability, responsiveness, assurance and empathy

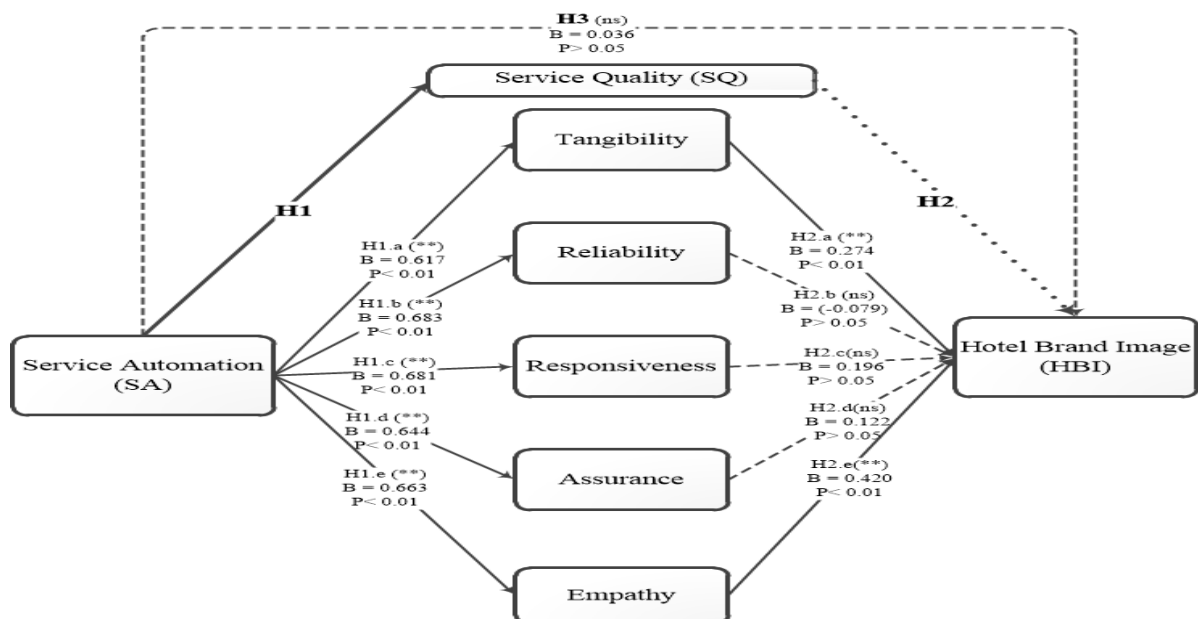
It is important to note that service automation (B=0.036, P>0.05) is not significant for hotel brand image. Tangibility (B=0.042, and P>0.05) and responsiveness (B= (-0.050) and P>0.05) are also no significant for hotel brand image. On the other hand, assurance (B=0.232, and P<0.01), reliability (B=0.332, and P<0.01) and empathy (B=0.375, and P<0.01) have significant effects on hotel brand image.

Table (23): Multi Linear Regression Analysis

		Coefficients ^a				
Model		Unstandardized		Standardized	t	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	0.137	0.104		1.319	0.188
	Service Automation	0.036	0.036	0.036	0.996	0.320
	Tangability	0.042	0.055	0.040	0.768	0.443
	Reliability	0.332	0.070	0.333	4.723	0.000
	Responsivness	-0.050	0.079	-0.050	-0.627	0.531
	Assurance	0.232	0.069	0.230	3.367	0.001
	Empthy	0.375	0.062	0.378	6.036	0.000

a. Dependent Variable: Hotel Brand Image

Based on the above figure, it is evident that only three hypotheses out of six are significant. The other three hypotheses are not significant as follows table summaries:



Note: →(**) = significant at 0.01, -.-> (ns)= not significant

Figure (2) : Research Model Summary

Source: Owned and Adopted by The Researcher (Design by Visio 2016)

Discussion of the Results

The researcher reviewed a number of literatures published on this subject, and despite their being conducted in different environments, these studies are comparable to the researcher's study community. The results of previous studies and the benefits of the current study were based upon previous studies. This had a significant impact on the design of the study.

Firstly, the similarities between the current study and previous studies:

The current study agreed in its objectives and results with many previous studies such as:

A similar objective was pursued in the present study as in those conducted by Minh et al. (2015), Mandil (2016), Ali et al. (2021), Bo and Gottfridsson (2021) and Kanyama et al. (2022) which examined customer perceptions of service quality.

A further conclusion is that this study agrees with Al-Shami et al. (2021) regarding the main purpose of the study, namely the exploration of how hotels use automation in order to carry out their services.

Further, the current study agrees with Mandil (2016), Alharbi (2018), Irama and Abror (2019) in terms of its primary focus, which is the impact of service quality on hotel brand image.

Additionally, the findings of Minh et al. (2015), Lee et al. (2018), Alharbi (2018), Irama and Abror (2019), Surjaatmadja et al. (2019) and Ali et al. According to 's study from Bo and Gottfridsson (2021) and Kanyama et al. (2022), the quality of service that a hotel brand provides significantly influences its image.

Moreover, the current study confirms the findings of Al-Shami et al. (2021), that hotel automation has a negative impact on customer perceptions and quality.

Second, The differences between the current study and previous studies

The current research differs in its aim partially from some studies, such as:

The current study differs from the study conducted by Surjaatmadja et al. (2019) in that it examined if brand image and service quality influence public use of remittances and customer satisfaction levels.

A difference between this study and the study by Jabeen et al. (2021) is that the current study uses the analytic hierarchy process, a multi-criteria decision-making methodology, to prioritize the factors influencing automation.

This study differs from Jabeen et al. (2021) concluded that human knowledge, services, and robotics applications are the most influential factors for automation and AI implementation.

There is a significant difference between the current study and the study conducted by Li et al. (2022), whereby they reported that automation had a positive impact on the quality of their service.

Conclusion

This research is primarily concerned with comparing guests and manager's perspectives regarding the relationship between service automation, service quality, and hotel brand image within Egypt's hotel chains context. In order to develop an integrative conceptual framework, a review of some of the current literature and a review of different theoretical perspectives were conducted. The framework was composed of three dimensions: service automation, service quality dimensions, and hotel brand image. The hypotheses were developed in a series of steps. This research model was created using Microsoft Visio 2016 to illustrate the relationship between the variables.

As part of this research, a survey was used as a means to acquire quantitative data for the purpose of examining the hypotheses based on a positivist approach. The questionnaire was distributed to 262 hotel chain guests. A questionnaire was administered and observed by the researcher. In order to examine the hypothesized associations between variables, SPSS 26.0 software was used.

According to the findings of the guest's survey, there is no significant impact of service automation on the brand image of hotel chains in Egypt. The quality of service provided by a hotel brand has a positive significant effect on its image. Even so, service automation has an extremely positive significant impact from the guest's perspective on service quality.

Limitations of the Research

It is primarily convenience sampling research that uses a non-probability methodology. A few studies have found that convenience sampling does not accurately reflect the characteristics of the general population. Despite the sample size of this research, and despite the statistical identification that the sample characteristics met the criteria for the intended population, it is imperative to exercise caution when attempting to generalize the results beyond this sample.

The second limitation of this research is that the research context is limited to hotel chains in Egypt. It is critical to note that different hotel classifications have different characteristics and may vary significantly. Consequently, it is difficult to generalize the results of this research.

Another limitation is that this research focused only on Arab guests due to the compatibility of the research with Corona Pandemic. This is because their values and views are similar to those of Arab guests. In addition, it is also difficult to generalize the results to foreign guests.

Finally, deciding on and employing one data collection technique can sometimes prove to be a challenge. This research employed a survey approach to collect data, which means that certain issues might be overlooked because consumers will only answer the questions provided.

Implications of the Research

This research extends the theory of service quality to include the service automation and image of the hotel brand. This created a novel model that was used for the first time in this research, as no researcher has ever used such a model.

This research helps to know how hotel managers and decision makers can meet the needs and expectations of their guests using the latest service automation technologies. In addition, it increases guest loyalty to the hotel brand image by providing better quality of services provided. In addition, it may help in developing Effective marketing strategies by determining the degree of loyalty of guests to the brand image.

It is the objective of this research to contribute to the body of knowledge by research how SA adaptation impacts service quality and hotel brand image from both the perspective of guests as well as hotel managers in Egypt.

Recommendations for Future Researches

Future research should focus on the following directions:

Firstly, due to the fact that the research only focused on hotels that are owned by chains in Egypt, future research might also focus on other types of hotels, such as those that are independently owned.

Secondly, based on the research model, it will be imperative to investigate the effect of the hotel brand image variable on customer satisfaction and loyalty in the future research.

Furthermore, based on the study model used in the study, which was a comprehensive analysis of all modern automation technologies used in hotels, future research should focus on one of them or study a specific section in order to examine their perceptions by guests in a specialized manner for specific technologies or for a specific section.

Finally, this research, which was conducted during the Corona pandemic period, should be used to prepare a future study measuring the differences between foreign guests and Arab guests regarding their use of the latest technology in hotels.

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