



The Effect of Using Service Automation and Robotic Technologies (SART) in Egyptian Hotels

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Abstract

Introduction: Service automation and robotic technologies (SART) are now the most important strategic technologies for hospitality; satisfy guests, Employees' knowledge and efficiency: investigate SWOT" strategic planning analysis to evaluate the SART in Egyptian hotels.

Objectives: The research objective was to shed light on the importance of SART in Egyptian hotels and its policy in entitles workers to the importance of service automation and robotic in ensuring Guest' satisfaction and safety.

Methodology: A survey was carried out on (28) Five Star Egyptian hotels. **Results:** The major contribution findings of this research showed that the effectiveness of the SART in assessing decisions, Increase Guest Satisfaction in Egyptian hotels.

Recommendations: The study recommended the need to apply the SART in Egyptian hotels. Therefore, management should be sensitive to the SART applications that were already going on within the hotels and seek means to support them. Hotels management in Egypt should direct some of their budgets to SART.

Research Objectives

The research objective was to shed light on the importance of Customer- Centric Marketing (CCM) apps and practices in Egyptian hotels and its policy in entitles workers to the importance of the hotel practices in terms of enhancing the importance of SART in in Egyptian hotels by assuring guest' satisfaction and CCM. The research objectives are to:

1. Shed light on the benefits and importance of SART in Egyptian hotels.
2. Assessment the role of hotel management and its policy in entitles workers to the importance of the service automation Technologies and CCM apps and practices.
3. Enhancing the importance of SART in increasing the effectiveness of Egyptian hotel by increase Guest' Satisfaction and safety.

Research Conceptual Framework

Study the SART as a tool to increase Guest’ Satisfaction and safety in Egypt foundational processes based on the Assessment of Benefits, Reality and the predictable opportunities and threats of SART in the Egyptian hotels.

This section constructs a conceptual framework to explore the impacts of SART use in Egyptian hotels (Guest’ Satisfaction, Employees’ knowledge and efficiency, safety and CCM).

The framework comprises three parts regarding the SART. First part: (The benefits of automation and technologies). The second part "SWOT" Strategic Planning Analysis (the actual situation of SART; the strangeness and weakness points “reality”; the predictable opportunities and threats of SART). The third part is the impact on the Egyptian hotels (Guest’ Satisfaction; Employees’ knowledge and efficiency; safety and CCM).

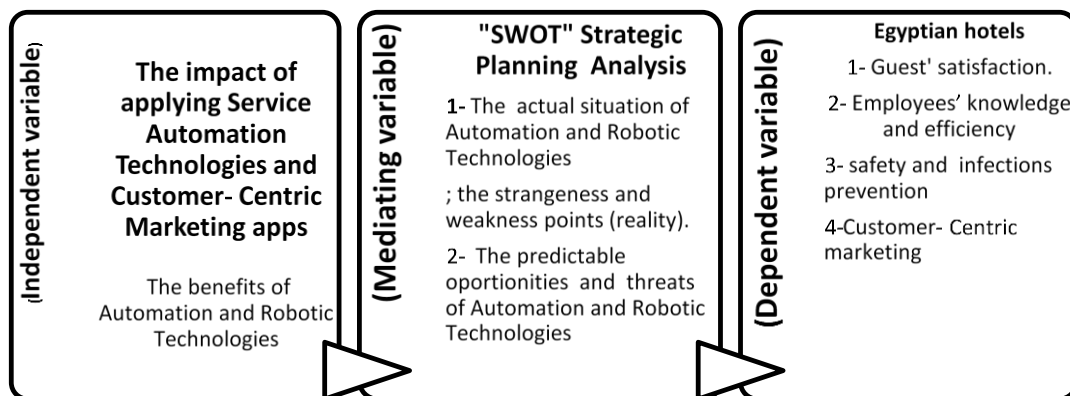


Figure.2. Research Conceptual Framework

Research Hypotheses

H1: There is a significant impact difference of applying SART in the development on the main variables of the study (Guest’ Satisfaction; Employees’ knowledge and efficiency; safety and CCM).

- ✓ **H1A:** Applying the SART in the Egyptian hotels positively influences the Guest’ Satisfaction.
- ✓ **H1B:** Adapting appropriate system of SART positively influences Employees’ knowledge and efficiency
- ✓ **H1C:** Using SART positively influences safety and infections prevention.
- ✓ **H1D:** Using SART positively influences CCM.

H2: There are significant relationships between the main variables of the study (Service automation and robotic; Guest’ Satisfaction; Employees’ knowledge and efficiency; safety and infections prevention; CCM).

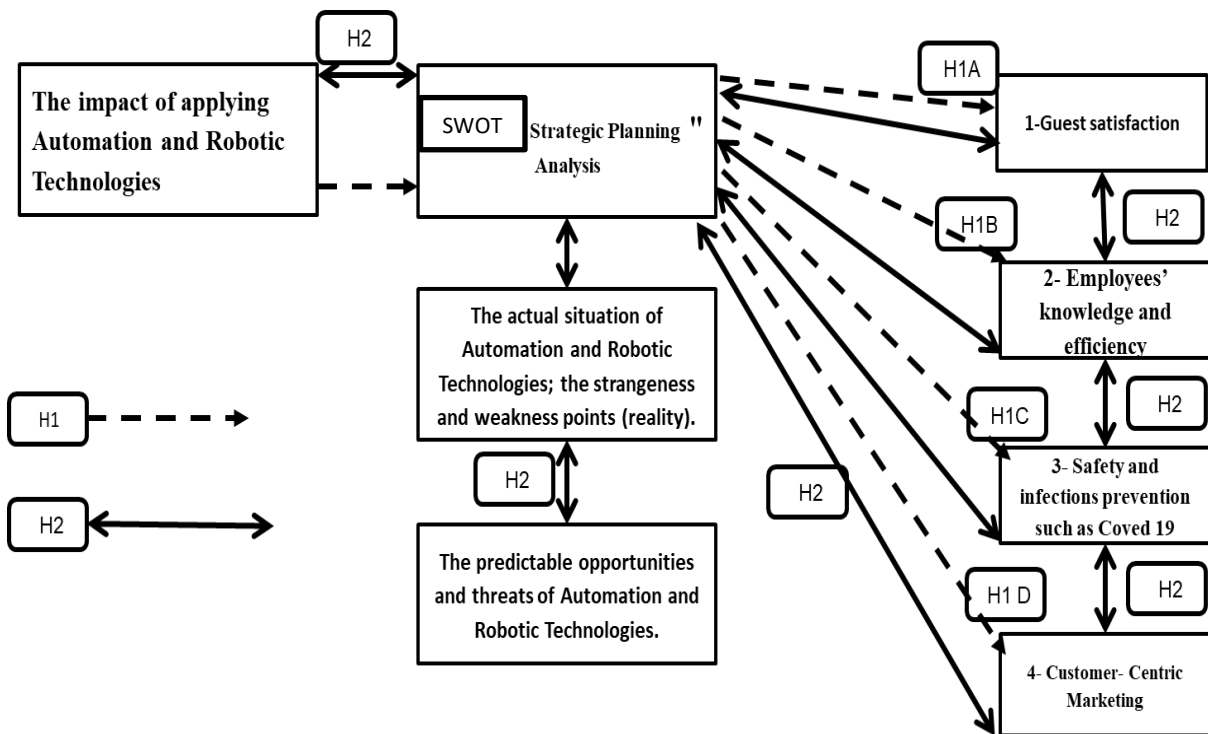


Figure.2. the research Hypotheses Framework

Introduction and background

Artificial intelligence, SART has arrived and became one of the important tools for success. The world has witnessed significant progress in Customer- Centric Marketing, robotics and service automation (Russell and Norvig, 2010; Kanda and Ishiguro, 2012; Warwick, 2012; Neapolitan and Jiang, 2013; Samani, 2016; Schmid and Betsch, 2019). Service Automation Technologies and Customer- Centric Marketing apps are used in the transportation as autonomous vehicles (Maurer et al., 2016), in education (Fridin and Belokopytov, 2014; Ivanov, 2016; Timms, 2016). Applications of artificial intelligence, Customer- Centric Marketing apps, service automation and robotics are everywhere (Kuo and Boger, 2016).

SART are entering travel, hospitality and hotels as well (Ritzer, 2015; Gladstone, 2016). A completely automated restaurant is also forthcoming in New York (Marks, 2016). Service automation and artificial intelligence provide vast opportunities to hotels to increase their operations and productivity deliver dependable product and service quality to the guests. While the application of artificial intelligence and Service Automation Technologies in hotels has received some attention by scholars (Borràs et al., 2014; Murphy et al., 2017^B). For that, this research aims to focus on SWOT Strategic Planning Analysis of SART in Egyptian Hotels in order to increase guest' satisfaction.

SART in Hotels

SART support the lodging segment of the hotel and industry, affecting different areas of hotel operations (López et al., 2013; Rodriguez-Lizundia et al., 2015). Hotels implemented self-service kiosks that enable guests to offer the hospitality

services such as: complete check-in and check-out (Kim and Qu, 2014). Check-in and /or out services were offered to guests on their mobile devices is improve convenience and service speed (e.g., Berezina, 2015; Hilton Honors, 2017; Marriott International, Inc., 2016; MGM Resorts International, 2017); mobile technology continues to develop to integrate mobile service ordering into a seamless hotel guest experience and placing requests right to guest fingertips (Trejos, 2015; Tussyadiah and Park, 2018).

Robots perform the repetitive, hard, dirty, and dangerous tasks that employees prefer to avoid. From the perspective of the hotels, robots transform their business processes (Ivanov, 2019); operations, marketing (Murphy et al., 2019); human resource and financial management (Tung and Law, 2017; Tung and Au, 2018; Qiu et al., 2019), improve productivity, save employees' time, and increase revenues (Ivanov, 2019). Robots are still quite expensive, although their prices are dropping significantly in recent years, and there are attempts to make affordable robots for hospitality and hotels (Kelly et al., 2017; Webster and Ivanov, 2020).

Robots may be found and supporting the different departments of hotels serving guests (Rajesh, 2015). The hotel features robotic front desk agents, porters, in-room, vacuum cleaners, and a robotic arm operating the luggage storage room (Markoff, 2014; Murphy et al., 2019).

Also, robot can call the guest room to serve and deliver requested items to the guest's (Hilton 2016). Robot can communicate and serving the hotel guests and providing suggestions for nearby attractions and activities; can learn every interaction with guests. Even though SART have already reached different hotel departments, adoption of these technologies is still low. Therefore, in the future the hotels industry may observe higher penetration of such technologies (Ivanov et al., 2018).

Service automation through self-service and robotic technologies offers opportunities for reduced labor costs, and increased efficiency of hotel operations. Moreover, as a rare and innovative technology, robots may wow hotel guests and stimulate guest delight (Kuo, 2017).

The search is applied in the hotels of many countries of the world and some Arab countries. Research in service robots and service automation in hotels is yet to take off. Future research needs to investigate the economic fundamentals of service automation and adoption of robots by hotel; evaluate guests', employees' and managers' perception of service robots and service automation; assess the impact of robots, artificial intelligence and service automation on service quality, hotels' performance; investigate into the ethical issues of the use of service robots and service automation in hotels (Sorrells, 2013; Ivanov, 2019).

Services Supported by the Framework

Investigate possible applications of this pervasive computing framework in the hotels industry. Applicant services such as: self-check-in, identity recognition, concierge, in-room resource access, ambience adjustment, service access, and personalization, and contactless payment, information access, tracking children via

RFID-enabled wristbands, smart waitresses and mini-bar, and performance management (Lorde et al., 2011; Kelly et al., 2017; Kim and Kim, 2018).

Furthermore, Self-Check-in is the process where a guest selects his room on his own through his own mobile device, for the check-in service, it establishes a connection to the server for updating room availability, and assigning the most suitable room to the guest (Trejos, 2015; Ivanov et al., 2018). Also, to identity recognition system which identifies the guests and their access permissions (Ngai et al 2008; López et al., 2013; Rodriguez-Lizundia et al., 2015).

Moreover, In-room resource access system that intelligently adjusts comfortable temperature and the air conditioner off when no one is in the room (López et al., 2013, Kim and Qu, 2014). In-room ambience adjustment is provided by smart walls which are inherently large displays (Lorde et al., 2011). Instead of calling the reception desk, service access by automatic voice recognition is used in the hotel for getting information regarding services such as breakfast/lunch time and menus, entertainment activities in the hotel (Ivanov et al., 2018).

Furthermore, Personalization is based on the past history of the guests and regarding the profile database. A created service is adjustment of room temperature to preferred levels (Tussyadiah et al., 2017). For the smart employees such waitress service uses the hand-held device to serve the guests (Tom Dieck et al., 2016).

Moreover, Contactless payment system is an automation service for in-hotel expenditures (Curtis, 2016); Information access; Tracking children is performed by using RFID-enabled wristbands; the information manager takes the information regarding the exact location of the children in the hotel (Oztaysi et al., 2009; Murphy et al., 2017B). Employee performance management is used to create measurable parameters for managing employees' performance (Ritzer, 2015).

Communication technologies play a decisive role in organizing life from the locale of the home in the coronavirus crisis. The intermediary spaces of public life, where we used to spend leisure time and transit times in cafés, restaurants, parks, nature, public transport, etc. emptied out, which created ghost towns and urban ghost spaces (Fuchs 2020; World Health Organization, 2020^a; World Health Organization, 2020^b).

Create an information point on the hotel website and social networks to share pertinent and applicable links to helpful sources; Establish an interior communications network; Develop an external communication strategy, including communicating with social media and a proactive sales and marketing strategy; Develop scenario-based holding statements ; Trail news updates and inform guest ; Keep in mind that associates who are confident and instill confidence that guest health and safety are taken seriously (Lanz et al., 2020; World Health Organization, 2020^d).

Consumer centric marketing (CCM)

Consumer centric marketing (CCM)- can be defined as "the discipline of capturing and deploying guest insights to enhance marketing effectiveness and better serve those guests that are brand's best prospects" (Maney *et al.* , 2002). CCM Definition:

This is a marketing tactic where businesses focus their marketing strategy around the consumer experience (Chavez et al., 2016). Human resources are the most important factor in the implementation of CCM because they are in direct contact with guests' desires, needs and expectations (Ivanovic et al., 2011).

Adopting a customer-centric marketing is not an easy task until now most of the hotels were using product-centric marketing strategy. It is possible to take its full benefits and gain a competitive advantage to satisfy guest' needs (Kearns, 2010; Gihan and Hany, 2015). Moreover, Customer-centric marketing is the most important characteristic in establishing a truly "digital-native" culture; Adopting digital culture means that they automatically become customer-centric hotels; The lack of adequate technologies to manage data is a great problem for hotels companies; if employees don't trained well and know how to deal with the available data, it is impossible to take full benefit of it (Kumar et al., 2016^{A+B}).

CRM tactic where businesses focus their marketing strategy around the consumer experience :Create a Personalized Experience and practice; Understand the customer; Identify the Needs of the customer; Involve the customer in the hotel Storytelling; Build a Long-Lasting Relationship with customer; continuing and non-stop Research; Empathy; Measure Development; Create Attractive Content; Be Consistent and Reliable; and Enhance the Customer experiment (Chavez et al., 2016).

Benefits of the Proposed Framework

SART systems provide increased CCM, Guest' Satisfaction, safety and prevent infections, and Employees' knowledge and productivity, decreased inventory costs and energy. Moreover, profit increases, competitive advantage and brand differentiation are achieved (Lorde et al., 2011; Murphy et al., 2017^B; Ivanov, 2019).

also, guest' satisfaction is the hotels goal, and is increased by reducing service times, employee performance, quality of service, profits, assisting find locations in the hotel by using the augmented reality applications, and by the smart mini-bar service. Furthermore, personalization, service innovation, competitive advantage, Guest' Satisfaction and safety (Gladstone, 2016; Kuo and Boger, 2016; Tussyadiah and Park, 2018).

Moreover, the in-room resource access service reduces the building energy expenses. The employee performance management and the smart-waitress service increase efficacy of the employees, and reduction cost. The self-check-in service eliminates the receptionist process; reduced cost and workload. The smart mini-bars provide fast service and automatic billing, reduce inventory levels and trigger automatic ordering. Thus, cost is reduced (Gökalp and Eren, 2013; Murphy, 2017A).

Materials and methodology

Data collection

A self-administered questionnaire include the employees' expectations about the SART as a tool to increase CCM and guest' satisfaction. The data was collected through the 3rd 2020 quarter "from July to September".

The Sample Population: The study was conducted on a sample of 28 five star hotels Egyptian hotels because they are the five star hotels is the highest category of hotels. The chosen of the hotels were due to variety of the locations and availability and opening they are on operation in the area of Sharm El-Sheikh, **Hurghada, and Cairo because they are the most working area in this time** . The hotels samples are as follows in table (1).

Table 1

The Sample Population

No.	Hotel name	No. of rooms
	Sharm El-Sheikh five star hotels	
1.	Four Seasons Resort Sharm El-Sheikh	238
2.	Hilton Sharm Dreams Resort	394+time share
3.	Iberotel Palace Sharm El-Sheikh	263
4.	Jaz Mirable Beach Resort	1001
5.	Maritim Jolie Ville Golf and Resort	418
6.	Marriott Hotel Sharm El-Sheikh	520
7.	Savoy Hotel Sharm El-Sheikh	790
8.	Sheraton Sharm El Sheikh, Resort, Villas.	847
9.	Sonesta Beach Resort Sharm El-Sheikh	520
10.	Sunrise Select Island View Resort	492
	Hurghada five star hotels	
1.	DESSOLE PYRAMISA SAHL HASHISH HOTEL	546
2.	HILTON HURGHADA RESORT	392
3.	HURGHADA MARRIOTT BEACH RESORT	318
4.	JAZ MAKADI STAR RESORT and SPA	167
5.	PARADISE GOLDEN 5 RESORT	878
6.	SERENITY MAKADI HEIGHTS	719
7.	STEIGENBERGER ALDAU BEACH HOTEL	388
8.	SUNRISE MAMLOUK PALACE RESORT	530
	Cairo five star hotels	
1.	Cairo Marriott Hotel	1250
2.	Conrad Cairo Hotel	617
3.	Fairmont Heliopolis Hotel	588
4.	Four Seasons Cairo Hotel	296
5.	Grand Nile Tower Cairo Hotel	715
6.	Ramses Hilton Hotel	859
7.	Semiramis Intercontinental Cairo	730
8.	Sheraton Cairo Hotel	342
9.	Sofitel El Gezira Hotel	436
10.	Sonesta Hotel Tower & Casino Cairo	409

Survey

The field study accomplished through survey by personal visits, phone calls, social media networks, emails, and fax. A survey was carried out on (28 Egyptian five star hotels in `Cairo, Hurghada, and Sharm El Sheikh to know which implement or use the SART.

Questionnaires provide an efficient way of collecting a large amount of data from a sizable population of SART as a tool to increase guest. The questionnaire consists of four parts or dimension: The first dimension: the benefits of SART, the Second dimension: is the actual situation “reality”, the third dimension: the predictable opportunities and threats, fourth dimension: Guest’ Satisfaction and safety.

Pilot study was conducted in this study during June 2020. The aim of the pilot study was to find out SART as a tool to increase Guest’ Satisfaction. Moreover, to ensure that the survey was well designed and easily understood by potential respondents, to examine the reliability and validity of the research tools as well as to develop and refine measure of the questions. Questionnaire was reviewed by some academic scholars to establish their appropriateness, clarity and to ease the understanding. Some alterations were suggested and then were implemented.

Questionnaire was then pre-tested in order to investigate the respondent’s understanding of scale items and to identify also any issues that was complex or confusing in order to develop suitable scale items to ensure the validity and reliability of the research. For this determination, a questionnaire was distributed to a sample of managers, department managers and supervisors. A number of 35 forms were distributed to respondents who were asked to complete them.

The field study accomplished through survey by phone calls, social media networks, and emails. The target population for this study was carried out with senior managers was mainly conducted through a self-administered questionnaire on the Rooms division, F&B and Sales and marketing departments’ data collected by personal visits, phone calls, emails, fax. The questionnaire was focused on the management and supervisors’ expectations about the knowledge management and its effect on staff in order evaluate the impact of Service Automation and Robotic Technologies (SART) to increase the guest satisfaction in Egyptian hotels.

The study was conducted from July 2020 to September 2020. 550 questionnaire forms were received only 442 completed forms were valid (80.36% validate rate). The target population for this study was the hotel employees, supervisors, Departmental head and managers; moreover, questionnaires were conducted with personal visits, internet, and online hotel employees, supervisors, and managers.

Survey was carried out on SART as a Tool to increase Guest’ Satisfaction and safety in Egypt. The questionnaire used to assess how SART as a tool to increase Guest’ Satisfaction and safety in Egypt. The data collected from hotels were used declares a descriptive analysis of managers, supervisors and employees’ questionnaire by using SPSS version 20.

Study Instrument reliability

For all scales, Cronbach's Alpha, the correlation coefficient was calculated to regulate the internal consistency of the scale. The Cronbach's Alpha reliability was computed, and the tests showed that the reliability coefficients for all the instruments were above 0.98, which indicates that the instrument was reliable for being used. The Reliability coefficient is over 0.70 it is considered "strongly

acceptable" in most social science situations. Cronbach alpha for all survey instruments as shown in the following table (2).

Table 2
Reliability Statistics

Cronbach's Alpha	No. of Items	No of questionnaires
.984	41	442

Results

This part of the study included the results of the questionnaire forms distributed on the internet on Facebook, online Google drive, email, and personnel visits. To find out what are the managers, supervisors and employees' opinions regarding the role of SART as a Tool to Increase Guest' Satisfaction in the Egyptian hotels.

Statistical package of social sciences (SPSS) version 20.0 for windows was used to analyze and compute the collected data, except the open question. Frequencies and percentage distributions were used to shed the light on the role of SART in the development of Guest' Satisfaction and safety.

Respondent's Demographics

Table 3

The respondents according to demographic and career data (n =442)

Demographic data	No.	%
Gender		
Male	402	91.0
Female	40	9.0
Total	442	100.0
Age		
From 18 to 28	40	9.0
Over 28 to 38	90	20.4
Over 38 to 48	150	33.9
Over 48 to 60	162	36.7
Total	442	100.0
Education		
Below first degree	120	27.1
Four years degree	302	68.3
Postgraduate	20	4.5
Total	442	100.0
Experience		
Less than 5 year	40	9.0
Between 5 and 10 years	130	29.4
More than 10 to 15 years	192	43.4
More than 15 years	80	18.1
Total	442	100.0
Position		
Employee "team member	60	13.6
Supervisor Operational	215	48.6
Departmental head	139	31.4

continued

Manager	28	6.3
Total	442	100.0
Department		
Sales and Marketing	52	11.8
Information technology (IT)	68	15.4
Rooms division	200	45.2
Food and beverage	82	18.6
Others	40	9.0
Total	442	100.0

The distribution of the respondents according to demographic data (n = 442) indicated that regarding the gender most of the respondents were Men; the percentage of respondents was 36.7 % at the age of over 48 to 60years and 33.9 Over 38 to 48 years. A Four years degree has a great percentage of 68.3 % of all respondents. Regarding the experience, most of the respondents were More than 10 to 15 years by the percentage of 43.4%. Concerning the position, most of the respondents were supervisor operational by the percentage of 48.6% and followed by departmental head by the percentage of 31.4%. In accordance with department, most of the respondents were Rooms division by the percentage of 45.2 %. The results indicate that most of the respondents are well educated, experience and able to apply SART to assuring and increasing Guest' Satisfaction as shown in table (3).

Evaluating the employees' vision regarding the SART in the Egyptian hotels:

Rendering the first dimension: the benefits the results showed that:

In accordance to the first acceptance average level was Applying the SART in the Egyptian hotels positively influence the Guest' Satisfaction. With (99.46 %) average, mean (4.97) and Std (0.16). results show that the importance of Applying the SART to increase Guest' Satisfaction . Concerning the second level agrees average was (98.91%) regarding agree with that Adapting appropriate system of SART efficiency positively influences CCM. with mean (4.95) and Std (0.23). this indicate the importance of the SART for CCM to enhance guests' satisfaction. Regarding SART positively increase the level of services process. Achieved the third level by average acceptance (98.73 %) with a mean (4.94) and Std (0.24). this show the role of SART in increase the level of services process to enhance guests' satisfaction. Regarding both of the Adapting appropriate system of SART efficiency positively influences the hotel to determine guests' expectations and needs achieved the fourth level by average acceptance (98.19 %) with mean (4.91) and Std (0.29). results show the role of SART in safety and infections prevention as well as read guests' expectations and needs. In the fifth rank was that SART positively increase customer' orientation, by a percentage of (97.83 %) as agree average, with a mean (4.89) and Std (0.31). results show the impact of SART in increase customer' orientation to enhance guests' satisfaction.

In accordance to the sixth acceptance average levels were SART affect employees' satisfaction. With (97.65 %) average, mean (4.88) and Std (0.32). results show that the importance of the SART to increase employees' satisfaction. Concerning the seventh level agrees average was (97.10%) regarding agree with that SART support the business revenue and profit increases. with mean (4.86) and Std (0.35). this

indicate the importance of the SART for support the business revenue and profit increases. Regarding role of SART to increase Internet based communication tools to enhance guests' satisfaction were Achieved the eighth level by average acceptance (96.56 %) with a mean (4.83) and Std (0.38). this show the role of SART in increase Internet based communication tools to enhance guests' satisfaction. Regarding all of the Using SART play a major role in influencing guest choice for the hotel; and the SART systems provide increased guest 'retention; and Adapting appropriate system of SART positively influences Loyalty programs achieved the ninth level by average acceptance (96.38 %) with mean (4.82) and Std (0.39). results show the role of SART in influencing guest choice for the hotel and increased guest 'retention. In accordance to the tenth acceptance average level was adapting appropriate system of SART positively influences Employees' knowledge and efficiency With (95.66 %) average, mean (4.78) and Std (0.41). results show that the importance of the SART to increase positively Employees' knowledge and efficiency These results agreed with (Lorde et al., 2011; Gökalp and Eren, 2013; Trejos, 2015; Gladstone, 2016; Kelly et al., 2017; Kim and Kim, 2018; Tussyadiah and Park, 2018; Ivanov, 2019; Murphy et al., 2019) .

According to the second dimension: the strangeness and weakness points "reality" (second dimension) the results showed that:

Table (4) lists the mean scores of the **second dimension: reality (Strengths and Weaknesses)**, the results showed that most of the samples (98.37%) were SART newly emerging technologies in hospitality services, with a mean (4.92) and std. deviation (0.27). Item no. 2, was aimed to know if There is a relationship between your expectations, satisfaction and SART, results showed that most of the sample (98.01%) was agreed with that. results indicates that, There is a relationship between SART and Guest' Satisfaction , with a mean (4.90) and std. deviation (0.30). Smart mini-bars provide fast service and automatic billing, results showed that (87.78%) of the respondents were agreed about these benefits, indicated the hotels care about fast and automatic service and billing, SD (4.39) and m (0.49). The hotels exploit their services using different SART. Achieved the fourth level by average acceptance (74.48 %) with mean (3.72) and Std (0. 0.65). results show that hotel using different service Automation Technologies and CCM apps and practices. In the fifth rank was that Hotel ensures that SART improve service performance and increase your satisfaction, by a percentage of (76.47 %) as agree average, with a mean (3.82) and Std (0.69). results show that Hotel ensures that SART improve service performance and increase Guest' Satisfaction. These results agreed with (Tung and Au, 2018; Ivanov, 2019; Webster and Ivanov, 2020).

On the other side, in the last ranking position (the sixteenth) was In-room resource access system that intelligently adjusts temperature settings based on personal preferences and the air conditioner off when no one is in the room, by percentage (56.20), with a mean (2.81) and Std (0.55); results indicate that Egyptian hotels need more care regarding applied SART. In accordance, SART are well applied in Egyptian hotels, by percentage (58.37), with a mean (2.92) and Std (0.74); results indicate that Egyptian hotels need more care regarding applied SART. Regarding

the 14th position is In-room atmosphere adjustment inherently large displays. By a percentage of (59.82 %) as agree average, with a mean (2.99) and Std (0.56); this indicates that the hotels need more care regarding In-room ambience. Concerning the 13th level agrees average was (60.77 %) regarding Identity recognition system which identifies the guests and their access permissions. With mean (3.04) and Std (0.70). These results agreed with (Kelly et al., 2017; Kim and Kim, 2018; Tussyadiah and Park, 2018).

Table 4 Evaluating the employees' vision regarding the SART in the Egyptian hotels																	
No.	Code	Factor	Strongly disagree		Disagree		Uncertain		agree		Strongly agree		Mean		Std. Deviation	Weighted Average %	Rank
			Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Statistic	Std. Error			
The first dimension: the benefits																	
1.	a1	Applying the SART in the Egyptian hotels positively influences the guest' satisfaction.	0	0	0	0	0	0	12	3	430	97	4.97	0.01	0.16	99.46	1
2.	a2	Adapting appropriate system of SART positively influences Employees' knowledge and efficiency.	0	0	0	0	0	0	96	22	346	78	4.78	0.02	0.41	95.66	10
3.	a3	Using SART play a major role in influencing guest choice for the hotel.	0	0	0	0	0	0	80	18	362	82	4.82	0.02	0.39	96.38	9*
4.	a4	SART systems provide increased guest' retention.	0	0	0	0	0	0	80	18	362	82	4.82	0.02	0.39	96.38	9*
5.	a5	Adapting appropriate system of SART efficiency positively influences assuring safety and infections prevention.	0	0	0	0	0	0	40	9	402	91	4.91	0.01	0.29	98.19	4*
6.	a6	SART support the business revenue and profit increases.	0	0	0	0	0	0	64	15	378	86	4.86	0.02	0.35	97.10	7
7.	a7	SART to increase Internet based communication tools to enhance guests' satisfaction.	0	0	0	0	0	0	76	17	366	83	4.83	0.02	0.38	96.56	8
8.	a8	Adapting appropriate system of SART positively influences loyalty programs.	0	0	0	0	0	0	80	18	362	82	4.82	0.02	0.39	96.38	9*
9.	a9	SART positively increase the level of services process.	0	0	0	0	0	0	28	6	414	94	4.94	0.01	0.24	98.73	3
10.	a10	Adapting appropriate system of SART efficiency positively influences CCM.	0	0	0	0	0	0	24	5	418	95	4.95	0.01	0.23	98.91	2
11.	a11	SART positively increase customer' orientation.	0	0	0	0	0	0	48	11	394	89	4.89	0.01	0.31	97.83	5
12.	a12	SART helps the hotel to determine guests' expectations and needs.	0	0	0	0	0	0	40	9	402	91	4.91	0.01	0.29	98.19	4*
13.	a13	SART affect employees' satisfaction.	0	0	0	0	0	0	52	12	390	88	4.88	0.02	0.32	97.65	6

continued

Table 4 Evaluating the employees' vision regarding the SART in the Egyptian hotels																	
No.	Code	Factor	Strongly disagree		Disagree		Uncertain		agree		Strongly agree		Mean		Std. Deviation	Weighted Average %	Rank
			Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Statistic	Std. Error			
The second dimension: reality (Strengths and Weaknesses)																	
1.	b1	SART applications applied in Egypt	0	0	0	0	170	39	228	52	44	10	3.71	0.03	0.64	74.30	7*
2.	b2	SART are well applied in Egyptian hotels.	0	0	140	32	198	45	104	24	0	0	2.92	0.04	0.74	58.37	15
3.	b3	Hotels management in Egypt directs good budgets to SART.	0	0	100	23	215	49	83	19	44	10	3.16	0.04	0.89	63.21	11
4.	b4	Management is very sensitive to the service automation technologies that were already going on within the company and seek mean to support them.	0	0	0	0	315	71	127	29	0	0	3.29	0.02	0.45	65.75	10*
5.	b5	Self-Check-in process where a guest selects the room on his own through his own mobile device or the hotel kiosk.	0	0	0	0	160	36	226	51	56	13	3.76	0.03	0.66	75.29	6
6.	b6	Identity recognition system which identifies the guests and access permissions.	0	0	100	23	225	51	117	27	0	0	3.04	0.03	0.70	60.77	13
7.	b7	In-room resource access system that adjusts comfortable temperature.	0	0	116	26	294	67	32	7	0	0	2.81	0.03	0.55	56.20	16
8.	b8	In-room ambience adjustment is provided by smart walls which are inherently large displays.	0	0	72	16	302	68	68	15	0	0	2.99	0.03	0.56	59.82	14
9.	b9	Automatic voice recognition for service access.	0	0	44	10	310	70	88	20	0	0	3.10	0.03	0.54	61.99	12
10.	b10	Personalization based on the profile database record the past history of the guests regarding climate, mini-bar usage, and TV.	0	0	44	10	221	50	177	40	0	0	3.30	0.03	0.64	66.02	9
11.	b11	For the smart employees such as waitress service by using hand-held device for recommending menu items to the guests.	0	0	84	19	146	33	212	48	0	0	3.29	0.04	0.77	65.79	10*
12.	b12	Contactless automation payment system.	0	0	0	0	170	39	228	52	44	10	3.71	0.03	0.64	74.30	7*
13.	b13	Tracking children by using RFID.	0	0	40	9	155	35	247	56	0	0	3.47	0.03	0.66	69.37	8

continued

Table 4																	
Evaluating the employees' vision regarding the SART in the Egyptian hotels																	
No.	Code	Factor	Strongly disagree		Disagree		Uncertain		agree		Strongly agree		Mean		Std. Deviation	Weighted Average %	Rank
			Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%			
14.	b14	Smart mini-bars provide service and automatic billing.	0	0	0	0	0	0	270	61	172	39	4.39	0.02	0.49	87.78	3
15.	b15	Hotel ensures that SART improve service performance and increase your satisfaction.	0	0	0	0	150	34	220	50	72	16	3.82	0.03	0.69	76.47	4
16.	b16	The hotel exploits their services using different SART.	0	0	0	0	170	39	224	51	48	11	3.72	0.03	0.65	74.48	5
17.	b17	There is a relationship between your expectations, satisfaction and SART.	0	0	0	0	0	0	44	10	398	90	4.90	0.01	0.30	98.01	2
18.	b18	SART newly emerging technologies in hospitality services	0	0	0	0	0	0	36	8	406	92	4.92	0.01	0.27	98.37	1
The third dimension: the predictable opportunities and threats																	
1.	c1	Applying SART still expensive.	0	0	0	0	36	8	134	30	272	62	4.53	0.03	0.64	90.68	3
2.	c2	SART need training.	0	0	0	0	0	0	120	27	322	73	4.73	0.02	0.45	94.57	2
3.	c3	SART need high investment.	0	0	0	0	36	8	279	63	127	29	4.21	0.03	0.57	84.12	4
4.	c4	SART need continuous improvement in Egypt.	0	0	0	0	140	32	218	49	84	19	3.87	0.03	0.70	77.47	5
5.	c5	SART are fast changing.	0	0	0	0	0	0	80	18	362	82	4.82	0.02	0.39	96.38	1
6.	c6	Egyptian hotels systems are adequately preparing us for SART.	0	0	145	33	209	47	88	20	0	0	2.87	0.03	0.72	57.42	9
7.	c7	Egyptian hotels are well aware of the effect of SART.	0	0	80	18	230	52	132	30	0	0	3.12	0.03	0.68	62.35	8*
8.	c8	Egyptian hotels are effectively implementing adequate SART.	0	0	36	8	219	50	187	42	0	0	3.34	0.03	0.62	66.83	7
9.	c9	Employees show that they have good awareness level regarding SART.	0	0	0	0	250	57	160	36	32	7	3.51	0.03	0.63	70.14	6
10.	c10	The activities SART are consistent with Egyptian hotels.	0	0	80	18	230	52	132	30	0	0	3.12	0.03	0.68	62.35	8*

According to the third dimension: the predictable opportunities and threats the results in table (4) showed that in accordance to the 1st acceptance average level was that the SART are fast changing, with (96.38 %) average, mean (4.82) and Std (0.39); this indicated that SART need continues awareness and developments. In the 2nd position was that SART need training, by a percentage of (94.57 %) as agree with average, with a mean (4.73) and Std (0.45); training needs to be continuously. Regarding the 3rd priority to the SART still expensive, with agree average level (90.68 %), mean was (4.53) and Std (0.64); this indicates that the SART still expensive. Dealing with the 4th importance with (84.12 %) as an acceptance average for SART need high investment, with a mean (4.21) and Std (0.57); this indicates that SART need high investment. Concerning the 5th agree level were SART need continuous improvement in Egypt, by average (77.47 %), with Std (0.70) and mean (3.87). These results agreed with (Tussyadiah and Park, 2018; Tung and Au, 2018).

On the other side, the last 9th acceptance average level was that Egyptian hotels systems are adequately preparing us for SART, by percentage (57.42), with a mean (2.87) and Std (0.72); this indicates that the hotels need more care regarding the adequate systems preparing. Egyptian hotels are well aware of the effect of SART. And the activities SART are consistent with Egyptian hotels. Were in the 8th efficiency average by the percentage of (62.35%), with a mean (3.12) and Std (0.68); this indicates that hotels need to consistent with and improve the awareness about the effect of SART. Regarding the 7th agree position where those Egyptian hotels are effectively implement adequate SART, by a percentage of (66.83%) with a mean (3.34) and Std (0.62); this indicates that Egyptian hotels need more care regarding the effectively implement of adequate SART. In the 6th position, Employees show that they have good awareness level regarding SART, by a percentage of (70.14 %) as agree average, with a mean (3.51) and Std (0.63); this indicates that hotels need more care regarding improving employees awareness regarding SART. These results agreed with (Kuo and Boger, 2016; Murphy, 2017^A; Qiu et al., 2019).

Respondents' opinion regarding to SART as a tool to increase guest' satisfaction in the Egyptian hotels

The following table illustrates the means, standard deviations and ranking of the factors clarifying the respondents' opinion regarding the SWOT strategic planning analysis of SART as a tool to increase Guest' Satisfaction in the Egyptian hotels.

Results showed that the mean scores of the respondents were as following: the first dimension the scale and application possibility of the benefits of SART by mean 4.87 and SD 0.27; the second dimension: reality (Strengths and Weaknesses) by mean 3.57 from and SD 0.52. The third dimension: the predictable opportunities and threats by mean 3.81 and SD 0.53. As shown in table (5).

Table 5

Descriptive analysis of the respondents' opinions according to SART as a Tool to Increase Guest' Satisfaction (n = 442)

No.	Dimension	Mean		Std. Deviation
		Statistic	Std. Error	Statistic
TotalA	The first dimension: the benefits	4.875	0.013	0.279
TotalB	The second dimension: reality (Strengths and Weaknesses)	3.573	0.025	0.523
TotalC	The third dimension: the predictable opportunities and threats	3.812	0.025	0.535

Hypotheses of the study:

Regarding, **H1:** There is a significant impact of applying SART in the development on the main variables of the study (Guest' Satisfaction ; Employees' knowledge; safety and infections prevention; CCM), One-Sample Test (T – test) in table (6) used to compare means to show the values differences regarding the extent of the impact of applying SART in the development on the main variables of the study (Service automation and robotic; Guest' Satisfaction ; Employees' knowledge and efficiency; safety and infections prevention such; CCM).

Moreover, to apply one-sample T-test, the value (a1 and a10) were suggested because they were a suitable value that referred to the highest levels were a1: Guest' Satisfaction. with Mean 4.97; Std. Deviation 0.16 ; T value -3.508-; Mean Difference -.02715- ; and Sig. (2-tailed) was 0.000 . Followed by a10: CCM with Mean 4.94; Std. Deviation 0 .22; T value -5.032- ; Mean Difference -.05430- ; and Sig. (2-tailed) were 0.000. The results showed that the p-value were definitely less than .05 (0.00). So, the null hypothesis was rejected and the first hypotheses of the research were valid. In the other word, there are no differences with a statistical significance between Guest' Satisfaction and CCM of service automation and robotic at the Egyptian hotels. These results assured the H1: There is a significant impact of applying SART in the development on the main variables of the study.

Table 6

One-Sample Test (T – test) used to compare means

One-Sample Statistics				One-Sample Test					
				Test Value = 5					
Code	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
a1	4.9729	.16270	.00774	-3.508-	441	.000	-.02715-	-.0424-	-.0119-
a2	4.7828	.41280	.01964	-11.062-	441	.000	-.21719-	-.2558-	-.1786-
a5	4.9095	.28722	.01366	-6.624-	441	.000	-.09050-	-.1173-	-.0636-
a10	4.9457	.22686	.01079	-5.032-	441	.000	-.05430-	-.0755-	-.0331-
totalA	4.8747	.27866	.01325	-9.454-	441	.000	-.12530-	-.1514-	-.0993-
totalB	3.5730	.52342	.02490	-57.316-	441	.000	-1.42697-	-1.4759-	-1.3780-
totalC	3.8115	.53527	.02546	-46.679-	441	.000	-1.18846-	-1.2385-	-1.1384-

Nonparametric tests regarding independent samples **H1**: There is a significant impact difference of applying SART in the development on the main variables of the study (Guest' Satisfaction ; Employees' knowledge and efficiency; safety and infections prevention; CCM). Results showed that T-test value was significant at (0.00) in each dimension this means that is revealed a statistically significant difference between the dimensions as shown in table 7.

On other words regarding **the role of SART on** comparing the (Guest' Satisfaction, Employees' knowledge and efficiency, safety and infections prevention, and CCM) Paired Samples Test assuring H1 through that: **H1A**: Applying the SART in the Egyptian hotels positively influences the Guest' Satisfaction, the Paired Samples Test were wit t value (-8.680-), and Sig. (2-tailed) (0 .000). Moreover, Paired Samples Correlations was with Correlation (0.525), and Sig. (0.000).

H1B: Adapting appropriate system of SART positively influences Employees' knowledge and efficiency, the Paired Samples Test were wit t value (8.518), and Sig. (2-tailed) (0 .000). Moreover, Paired Samples Correlations was with Correlation (0.855), and Sig. (0.000). **H1C**: Using SART positively influences safety and infections prevention, the Paired Samples Test were wit t value (-5.049-), and Sig. (2-tailed) (0 .000). Moreover, Paired Samples Correlations was with Correlation (0.869), and Sig. (0.000). **H1D**: Using SART positively influences CCM, the Paired Samples Test were wit t value (-7.648-), and Sig. (2-tailed) (0 .000). Moreover, Paired Samples Correlations was with Correlation (0.720), and Sig. (0.000).

Table 7

Paired Samples T-Test of the variables compared to each other (N: 442).

Paired Samples Statistics				Paired Samples Test		Paired Samples Correlations		
		Mean	Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)	Correlation	Sig.
Pair 1	TotalA: The first dimension: the benefits.	4.8747	.27866	.01325	-8.680-	.000	.525	.000
	a1: Guest' Satisfaction.	4.9729	.16270	.00774				
Pair 2	TotalB: The second dimension: reality (Strengths and Weaknesses)	3.5730	.52342	.02490	-58.729-	.000	.290	.000
	a1: Guest' Satisfaction.	4.9729	.16270	.00774				
Pair 3	TotalC: The third dimension: the predictable opportunities and threats.	3.8115	.53527	.02546	-48.074-	.000	.316	.000
	a1: Guest' Satisfaction.	4.9729	.16270	.00774				
Pair 4	TotalA: The first dimension: the benefits.	4.8747	.27866	.01325	8.518	.000	.855	.000
	a2: Employees' knowledge and efficiency	4.7828	.41280	.01964				
Pair 5	TotalB: The second dimension: reality (Strengths and Weaknesses)	3.5730	.52342	.02490	-71.267-	.000	.734	.000
	a2: Employees' knowledge and efficiency	4.7828	.41280	.01964				

continued

Pair 6	TotalC: The third dimension: the predictable opportunities and threats.	3.8115	.53527	.02546	-58.966-	.000	.763	.000
	a2: Employees' knowledge and efficiency	4.7828	.41280	.01964				
Pair 7	TotalA: The first dimension: the benefits.	4.8747	.27866	.01325	-5.049-	.000	.869	.000
	a5: Safety and infections prevention such.	4.9095	.28722	.01366				
Pair 8	TotalB: The second dimension: reality (Strengths and Weaknesses)	3.5730	.52342	.02490	-63.950-	.000	.543	.000
	a5: Safety and infections prevention.	4.9095	.28722	.01366				
Pair 9	TotalC: The third dimension: the predictable opportunities and threats.	3.8115	.53527	.02546	-52.825-	.000	.579	.000
	a5: Safety and infections prevention.	4.9095	.28722	.01366				
Pair 10	TotalA: The first dimension: the benefits.	4.8747	.27866	.01325	-7.648-	.000	.720	.000
	a10: CCM.	4.9457	.22686	.01079				
Pair 11	TotalB: The second dimension: reality (Strengths and Weaknesses)	3.5730	.52342	.02490	-60.600-	.000	.415	.000
	a10: CCM.	4.9457	.22686	.01079				
Pair 12	TotalC: The third dimension: the predictable opportunities and threats.	3.8115	.53527	.02546	-49.950-	.000	.453	.000
	a10: CCM.	4.9457	.22686	.01079				

Regarding Employees opinion concerning, the effect of the main variables of the study (Employees' knowledge and efficiency; safety and infections prevention; CCM; and service automation and robotic) on Guest' satisfaction.

The first hypotheses were tested using **NPar Tests "Kruskal-Wallis Test"**. **Test Statistics^{a,b}** (a. Kruskal Wallis Test for Employees' knowledge and efficiency; safety and infections prevention ; CCM; and service automation and robotic) and b. Grouping Variable: Guest' Satisfaction. Results shows that there is a statically differences in accordance Guest' Satisfaction on Employees opinion regarding the role of service automation and robotic in the Egyptian hotels, with (Chi-Square) values ranging from (31.273) to (214.347); Asymp. Sig. (.000) this indicate there is statistically significant relations. **Results indicate that** the role of (Employees' knowledge and efficiency; safety and infections prevention; CCM; and service automation and robotic) in the Egyptian hotels have a statically differences in accordance Guest' Satisfaction. This agreed with **H1**.

On other word: service automation and robotic have an impact on the Guest' Satisfaction the results show that the first dimension: the benefits positively influence the Guest' Satisfaction with (Chi-Square) value (67.179), Asymp. Sig. (0.000), the second dimension: reality (Strengths and Weaknesses) positively influences the Guest' Satisfaction with (Chi-Square) value (31.273), Asymp. Sig. (0.000); the third dimension: the predictable opportunities and threats positively influence the Guest' Satisfaction with (Chi-Square) value (31.565), Asymp, Sig. (0.000). These indicate there are statistically significant relations. These results agreed with H1A: Applying the SART in the Egyptian hotels positively influences the Guest' Satisfaction. As shown in table (8).

Table 8

The effect of the main variables of the study on Guest' satisfaction NPar Tests

	Ranks			Test Statistics ^{a,b}	
	a1: Guest' Satisfaction.	N	Mean Rank	Chi-Square	Asymp. Sig.
a2: Employees' knowledge and efficiency	Agree	12	48.50	44.356	.000
	Strongly agree	430	226.33		
a5: Safety and infections prevention.	Agree	12	20.50	123.685	.000
	Strongly agree	430	227.11		
a10: CCM.	Agree	12	12.50	214.347	.000
	Strongly agree	430	227.33		
TotalA: The first dimension: the benefits.	Agree	12	6.50	67.179	.000
	Strongly agree	430	227.50		
TotalB: The second dimension: reality (Strengths and Weaknesses)	Agree	12	18.50	31.273	.000
	Strongly agree	430	227.17		
TotalC: The third dimension: the predictable opportunities and threats.	Agree	12	18.50	31.565	.000
	Strongly agree	430	227.17		

a. Kruskal Wallis Test

b. Grouping Variable: a1 : Guest' Satisfaction

To demonstrate the effect of different degrees of statistical significance between the mean of the different variables that effect the role of SART as a Tool Support CCM and Increase Guest' Satisfaction in the Egyptian hotels in accordance to the different employees' positions, analysis of variance - ANOVA was used.

A one-way ANOVA method was used to study a role of SART from the different employees' positions; they are three dimensions: The first dimension: the benefits; the second dimension: reality "Strengths and Weaknesses"; and The third dimension: the predictable opportunities and threats. As well as, evaluate the impact of the employees' positions on the main study variables (Guest' Satisfaction, Employees' knowledge and efficiency, Safety and infections prevention.

The study evaluates the employees' vision regarding the impact of employees' positions on evaluating the main study variables (SART, Guest' Satisfaction, Employees' knowledge and efficiency, Safety and infections prevention, CCM). As a comparison of both the scale and application possibility of the employees' positions point of views and the extent of application of SART.

On the other hand, compared to evaluating the employees' vision regarding the impact of SART as a Tool Support CCM and Increase Guest' Satisfaction. Therefore, the important result means that (The extent of Guest' Satisfaction the value for F was "31.545" and evaluating the employees' vision regarding the CCM. the value for F was "84.121", with Sig "0.000". These indicate there are statistically significant relations, as shown in table (9).

Table 9

One-way analysis of variance - ANOVA to compare the impact of the respondents' opinions regarding SART in accordance to the positions

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
a1: Guest' Satisfaction.	Between Groups	2.074	3	.691	31.545	.000
	Within Groups	9.600	438	.022		
	Total	11.674	441			
a2: Employees' knowledge and efficiency	Between Groups	45.177	3	15.059	220.067	.000
	Within Groups	29.972	438	.068		
	Total	75.149	441			
a5: Safety and infections prevention such.	Between Groups	23.047	3	7.682	252.362	.000
	Within Groups	13.333	438	.030		
	Total	36.380	441			
a10: CCM.	Between Groups	8.297	3	2.766	84.121	.000
	Within Groups	14.400	438	.033		
	Total	22.697	441			
TotalA: The first dimension: the benefits.	Between Groups	29.408	3	9.803	887.992	.000
	Within Groups	4.835	438	.011		
	Total	34.243	441			
TotalB: The second dimension: reality (Strengths and Weaknesses)	Between Groups	99.364	3	33.121	676.163	.000
	Within Groups	21.455	438	.049		
	Total	120.819	441			
TotalC: The third dimension: the predictable opportunities and threats.	Between Groups	105.78	3	35.26	750.755	.000
	Within Groups	20.571	438	.047		
	Total	126.351	441			

The first hypotheses were tested using **NPar Tests** "Kruskal-Wallis Test". **Test Statistics^{a,b}** (a. Kruskal Wallis Test for the impact of applying SART in the development on the main variables of the study (Guest' Satisfaction ; Employees' knowledge and efficiency; safety and infections prevention; CCM) ; and b. Grouping Variable: position). Results shows that there is strong impact of the applying SART on Guest' Satisfaction, CCM and the other variables, with (Chi-Square) values ranging from (78.354) to (372.420); Asymp. Sig. (.000) this indicate there is statistically significant relations. As shown in table (10).

On other words: The effect of the respondents' opinions regarding SART in accordance to the resonant' positions NPar Tests were as following :Results shows that there is strong impact of the applying SART on Safety and infections prevention, with (Chi-Square) values ranging (279.373); there is strong impact of the applying SART on a2: Employees' knowledge and efficiency , with (Chi-Square) values

ranging (265.114); there is strong impact of the applying SART on a10: CCM, with (Chi-Square) values ranging (161.208); there is strong impact of the applying SART on a1: Guest' Satisfaction, with (Chi-Square) values ranging (78.354); all Asymp. Sig. were (.000) these indicate there is statistically significant relations. These results agreed with H1: There is a significant impact of applying SART in the development on the variables.

Table 10

The effect of the respondents' opinions regarding SART in accordance to the resonant' positions NPar Tests.

Ranks				Test Statistics ^{a,b}	
	Resonant' positions	N	Mean Rank	Chi-Square	Asymp. Sig.
a1: Guest' Satisfaction.	Employee "team member"	60	183.30	78.354	.000
	Supervisor Operational	215	227.50		
	Departmental head	139	227.50		
	Manager	28	227.50		
a2: Employees' knowledge and efficiency	Employee "team member"	60	48.50	265.114	.000
	Supervisor Operational	215	232.50		
	Departmental head	139	269.50		
	Manager	28	269.50		
a5: Safety and infections prevention such.	Employee "team member"	60	94.17	279.373	.000
	Supervisor Operational	215	241.50		
	Departmental head	139	241.50		
	Manager	28	241.50		
a10: CCM.	Employee "team member"	60	145.10	161.208	.000
	Supervisor Operational	215	233.50		
	Departmental head	139	233.50		
	Manager	28	233.50		
TotalA: The first dimension: the benefits.	Employee "team member"	60	30.77	308.947	.000
	Supervisor Operational	215	237.44		
	Departmental head	139	269.50		
	Manager	28	269.50		
TotalB: The second dimension: reality (Strengths and Weaknesses)	Employee "team member"	60	32.10	372.420	.000
	Supervisor Operational	215	168.02		
	Departmental head	139	344.68		
	Manager	28	426.50		
TotalC: The third dimension: the predictable opportunities and threats.	Employee "team member"	60	34.50	368.030	.000
	Supervisor Operational	215	168.51		
	Departmental head	139	342.88		
	Manager	28	426.50		

a. Kruskal Wallis Test

b. Grouping Variable: position

Moreover; there is a role of SART on support CCM and increase Guest' Satisfaction. a. Friedman Test shows that evaluating the employees' vision regarding

the impact of the SART support CCM and increase Guest' Satisfaction were the 'higher main rank and agree with Mean Rank (5.24) followed by the impact of the SART support CCM with Mean Rank (5.15) . Regarding, evaluating the employees' vision regarding the impact of SART on support CCM and increase Guest' Satisfaction.

The results also showed that Chi-Square 2468.463 and the parameter ratio Sig. (0.000). This means that there is an effect of different degrees of statistical significance between the average of the different variables that measure the role of SART in the main variables of the study (Guest' Satisfaction ; Employees' knowledge and efficiency; safety and infections prevention; CCM). These confirm the H1: There is a significant impact of applying SART in the development on the main variables of the study (Guest' Satisfaction ; Employees' knowledge and efficiency; safety and infections prevention; CCM). As shown in table (11).

Table 11

a Friedman Test among the various variables that influence the role of service automation and robotic in CCM and Guest' Satisfaction (N. 442).

code	Ranks		a. Friedman Test (N. 442).		
		Mean Rank	Chi-Square	df	Asymp. Sig.
a1	Guest' Satisfaction.	5.24	2468.463	6	.000
a2	Employees' knowledge and efficiency	4.67			
a5	Safety and infections prevention.	5.05			
a10	CCM.	5.15			
TotalA	The first dimension: the benefits.	4.90			
TotalB	The second dimension: reality (Strengths and Weaknesses)	1.00			
TotalC	The third dimension: the predictable opportunities and threats.	2.00			

H2: There are significant relationships between the main variables of the study (Service automation and robotic; Guest' Satisfaction; Employees' knowledge and efficiency; safety and infections prevention; CCM). As shown in table (11) and figure (2).

Regarding the research hypothesis test **H2:** There are significant relationships between the main variables of the study (Service automation and robotic; Guest' Satisfaction; Employees' knowledge and efficiency; safety and infections prevention; CCM). Research hypotheses were tested using Pearson correlation coefficient. Analyses were done to ensure that no violation of assumptions of normality and linearity.

Results showed that there is a significant correlation between the benefits; strangeness and weakness points "reality"; and the predictable opportunities and threats of SART. With (r) values ranging from (0.290) to (0.982) (p<.01) **. The correlation was significant at the 0.01 level (2-tailed). Based on the results of Pearson correlation

analysis which represent proposed linear relationship, all the research hypotheses were positive and supported.

On other words, Results showed that there is a significant correlation between: (1) Applying the SART vs the Guest’ Satisfaction, with (r) values (0 .525**), and p (.000). (2) Adapting appropriate system of SART vs Employees’ knowledge and efficiency, with (r) values (0.855**), and p (.000). (3) Using SART vs safety and infections prevention , with (r) values (0.869**), and p (.000). (4) Using SART vs CCM, with (r) values (0 .720**), and p (.000). The following tables (12-13) illustrate that:

Table 12

The relationships between the main variables of the study.

Correlations								
		a1	a2	a5	a10	Total A	Total B	Tot alC
a1: Guest’ Satisfaction.	Pearson Correlation	1						
	Sig. (2-tailed)							
a2: Employees’ knowledge and efficiency	Pearson Correlation	.317**	1					
	Sig. (2-tailed)	.000						
a5: Safety and infections prevention .	Pearson Correlation	.530**	.599**	1				
	Sig. (2-tailed)	.000	.000					
a10: CCM.	Pearson Correlation	.697**	.455**	.760**	1			
	Sig. (2-tailed)	.000	.000	.000				
TotalA: The first dimension: the benefits.	Pearson Correlation	.525**	.855**	.869**	.720**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
TotalB: The second dimension: reality (Strengths and Weaknesses)	Pearson Correlation	.290**	.734**	.543**	.415**	.695**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000		
TotalC: The third dimension: the predictable opportunities and threats.	Pearson Correlation	.316**	.763**	.579**	.453**	.742**	.982**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	

** . Correlation is significant at the 0.01 level (2-tailed). (p<.01). r: Pearson coefficient

Table 13

Hypothesis test summary.

Null Hypothesis	Test	Sig.	Decision
The distribution of a1, a2, a5, a10, totalA, totalB, and totalC are the same.	Related Samples Friedman’s Two way analysis of variance by ranks	0.000	reject the null hypothesis

Asymptotic significances are displayed. The significance level is 0.05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distributions of a1, a2, a5, a10 totalA, totalB and totalC are the same.	Related-Samples Friedman's Two-Way Analysis of Variance by Ranks	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Fig.3. Hypothesis test summary

Conclusions

Concerning the employees’ opinion towards the first dimension: the benefits the results showed that it’s importance to apply the SART to: increase Guest’ Satisfaction, support CCM to enhance guests’ satisfaction. Have a role in increase the level of services process to enhance guests’ satisfaction. Have effective role in safety and infections prevention as well as read guests’ expectations and needs. Increase customer’ orientation to enhance guests’ satisfaction. Increase employees’ satisfaction. Support the business revenue and profit increases. Increase Internet based communication tools to enhance guests’ satisfaction. Play a major role in influencing guest choice for the hotel; provide increased guest ‘retention; positively influences Loyalty programs. Positively influences Employees’ knowledge and efficiency. increase positively Employees’ knowledge and efficiency These results agreed with (Lorde et al., 2011; Gökalp and Eren, 2013; Trejos, 2015; Gladstone, 2016; Kelly et al., 2017; Smirnova et al., 2017; Kim and Kim, 2018; Tussyadiah and Park, 2018; Ivanov, 2019; Murphy et al., 2019) .

According to the second dimension: the strangeness and weakness points “reality” results showed the strong points were: SART are newly emerging technologies in hospitality services. There is a relationship between SART and Guest’ Satisfaction. The Smart mini-bars provide fast service and automatic billing. The hotels care about fast and automatic service and billing. The hotels exploit their services using different Service Automation Technologies and CCM apps and practices. Hotels are using different Service Automation Technologies and CCM apps and practices. Hotel ensures that SART improve service performance and increase the guest satisfaction, the Hotel ensures that SART improve service performance and increase Guest’ Satisfaction. These results agreed with (Law et al., 2014; Tong, 2015; Tung and Au, 2018; Ivanov, 2019; Webster and Ivanov, 2020).

On the other side regarding the weaknesses were: Egyptian hotels need more care about in-room resource access is the system that intelligently adjusts comfortable temperature and the air conditioner off when no one is in the room. Egyptian hotels need more care regarding applied SART. Egyptian hotels need more care regarding applied SART. The hotels need more care regarding in-room ambience. Hotels need more care regarding identity recognition system which identifies the guests and their

access. These results agreed with (Kelly et al., 2017; Kim and Kim, 2018; Tussyadiah and Park, 2018).

According to the third dimension: the predictable opportunities the results showed that: the SART are fast changing; this indicated that SART need continues awareness and developments. SART need training; training needs to be continuously. The SART is still expensive, SART need high investment. SART need continuous improvement in Egypt, These results agreed with (Tussyadiah and Park, 2018; Tung and Au, 2018; Youssef et al., 2018).

On the other side, According to the third dimension: the threats the results showed that: Egyptian hotels systems are not adequately preparing us for SART, this indicates that the hotels need more care regarding the adequate systems preparing. Egyptian hotels are not well aware of the effect of SART. And the activities SART are consistent with Egyptian hotels. Hotels need to consistent with and improve the awareness about the effect of SART. Egyptian hotels are not effectively implement adequate SART, this indicates that Egyptian hotels need more care regarding the effectively implement of adequate SART. Employees show that they have not good awareness level regarding SART; this indicates that hotels need more care regarding improving employees' awareness regarding SART. These results agreed with (Kuo and Boger, 2016; Murphy, 2017^A; Qiu et al., 2019).

Research hypotheses were H1: There is a significant impact difference of applying SART in the development on the main variables of the study. H2: There are significant relationships between the main variables of the study. Research hypotheses were tested and statically analyzed.

The hotel employees' Preferences Regarding the effect of using service automation and robotic technologies (SART) in Egyptian hotels model

The process of developing was a ranking model regarding the managers' evaluation regarding the effect of using service automation and robotic technologies (SART) in Egyptian hotels which aim to shed light on the most recurrent importance and situation as well as SWOT analysis of using (SART) in Egyptian hotels from the perspectives of the hotel employees so as to improve the guests' satisfaction. The aim of this model was to shed the light on the most important attributes of Facilities SART from the perspectives of employees and managers in order to better meet the guest satisfaction (see table 14).

Table 1 4

Evaluating the employees' vision regarding the SART in the Egyptian hotels Model

No.	Code	Factor	Weighted Average %	Rank
The first dimension: the benefits				
1.	a1	Applying the SART in the Egyptian hotels positively influences the guest' satisfaction.	99.46	1
2.	a10	Adapting appropriate system of SART efficiency positively influences CCM.	98.91	2
3.	a9	SART positively increase the level of services process.	98.73	3
4.	a5	Adapting appropriate system of SART efficiency positively influences assuring safety and infections prevention.	98.19	4*
5.	a12	SART helps the hotel to determine guests' expectations and needs.	98.19	4*
6.	a11	SART positively increase customer' orientation.	97.83	5
7.	a13	SART affect employees' satisfaction.	97.65	6
8.	a6	SART support the business revenue and profit increases.	97.10	7
9.	a7	SART to increase Internet based communication tools to enhance guests' satisfaction.	96.56	8
10.	a3	Using SART play a major role in influencing guest choice for the hotel.	96.38	9*
11.	a4	SART systems provide increased guest' retention.	96.38	9*
12.	a8	Adapting appropriate system of SART positively influences loyalty programs.	96.38	9*
13.	a2	Adapting appropriate system of SART positively influences Employees' knowledge and efficiency.	95.66	10
The second dimension: reality (Strengths and Weaknesses)				
1.	b18	SART newly emerging technologies in hospitality services	98.37	1
2.	b17	There is a relationship between your expectations, satisfaction and SART.	98.01	2
3.	b14	Smart mini-bars provide service and automatic billing.	87.78	3
4.	b15	Hotel ensures that SART improve service performance and increase your satisfaction.	76.47	4
5.	b16	The hotel exploits their services using different SART.	74.48	5
6.	b5	Self-Check-in process where a guest selects the room on his own through his own mobile device or the hotel kiosk.	75.29	6
7.	b1	SART applications applied in Egypt	74.30	7*
8.	b12	Contactless automation payment system.	74.30	7*
9.	b13	Tracking children by using RFID.	69.37	8
10.	b10	Personalization based on the profile database record the past history of the guests regarding climate, mini-bar usage, and TV.	66.02	9
11.	b4	Management is very sensitive to the service automation technologies that were already going on within the company and seek mean to support them.	65.75	10*
12.	b11	For the smart employees such as waitress service by using hand-held device for recommending menu items to the guests.	65.79	10*
13.	b3	Hotels management in Egypt directs good budgets to SART.	63.21	11

continued

14.	b9	Automatic voice recognition for service access.	61.99	12
15.	b6	Identity recognition system which identifies the guests and access permissions.	60.77	13
16.	b8	In-room ambience adjustment is provided by smart walls which are inherently large displays.	59.82	14
17.	b2	SART are well applied in Egyptian hotels.	58.37	15
18.	b7	In-room resource access system that adjusts comfortable temperature.	56.20	16
		The third dimension: the predictable opportunities and threats		
1.	c5	SART are fast changing.	96.38	1
2.	c2	SART need training.	94.57	2
3.	c1	Applying SART still expensive.	90.68	3
4.	c3	SART need high investment.	84.12	4
5.	c4	SART need continuous improvement in Egypt.	77.47	5
6.	c9	Employees show that they have good awareness level regarding SART.	70.14	6
7.	c8	Egyptian hotels are effectively implementing adequate SART.	66.83	7
8.	c7	Egyptian hotels are well aware of the effect of SART.	62.35	8*
9.	c10	The activities SART are consistent with Egyptian hotels.	62.35	8*
10.	c6	Egyptian hotels systems are adequately preparing us for SART.	57.42	9

The importance of this ranking model was to provide the perspectives regarding the most important guests' requirements and priorities for Facilities Technological Amenities, in order to better understand the guests' requirements for the role of applying technology at the guest room on the guest's choice of the hotel and trying to meet these requirements, which will lead to guest satisfaction and retention.

Recommendations

Referring to the previous conclusion the study recommends the following to improve the effect of using service automation and robotic technologies (SART) in Egyptian hotels:

Recommendation	Responsible for Implementation	Mechanisms of Implementation
1.Hotels managers should be fully aware of the guests' priorities regarding SART.	Hotels managers	Research studies
2.Hotels managers should be fully aware of guest' priorities regarding the role of applying SART at the guest services on the guest's choice of the hotel.	Hotels managers	Research studies
3.Hygiene and safety should be the first priorities of applying SART.	All employees , managers; and Ministry of health	Apply the food safety system

4. Guest' Satisfaction should be the core priorities of the SART.	The hotel management	Apply the SART and CCM practices
5. Identify the factors and elements that would increase guest satisfaction through CCM programs.	The hotel management	Apply CCM practices
6. Egyptian hotels should pay attention to evaluate and improve the SART continually.	The hotel management	Apply The quality assurance and developing systems
7. Egyptian hotels should increase SART programs and introduce new practices frequency.	The hotel	Increase SART programs and introduce new practices frequency.
8. Hotels must develop a plan for SART to increase CCM.	The management	Develop a strategic plans
9. Egyptian hotels should increase SART programs and introduce new practices frequency.	The hotel management	Increase SART programs and introduce new practices frequency
10. More attention should be paid to the aspect of SART inside hotels, through colleges and institutes of hotels, and a proposal to include the loyalty programs	The hotel management	Apply attractive loyalty programs
11. Establishing and institutes to teach SART for hospitality industry are recommended.	Ministry of high education	Establishing and institutes to teach SART for hospitality
12. Egyptian hotels should manage the weaknesses such as:		
<ul style="list-style-type: none"> • Egyptian hotels need more care about in-room resource access system that adjusts temperature and the air conditioner off when no one is in the room. 	Engineering and maintenance	Regular follow up and forecasting maintenance
<ul style="list-style-type: none"> • Egyptian hotels need more care regarding applied SART. 	Management and owners	Applied SART
<ul style="list-style-type: none"> • The hotels need more care regarding in-room ambience. 	Engineering and maintenance	Regular follow up and forecasting maintenance

<ul style="list-style-type: none"> Hotels need more care regarding Identity recognition system which identifies the guests and support them access approvals. 	Information technologies departments	Identity recognition system which identifies the guests and support them access approvals.
13. Egyptian hotels should care about the predictable threats such as:		
<ul style="list-style-type: none"> Egyptian hotels need more care regarding the adequate SART systems preparing. 	Owners and management	adequate SART systems preparing
<ul style="list-style-type: none"> Hotels need to consistent with and improve the awareness about the effect of SART. 	Training department	Training and improve the awareness about the effect of SART
<ul style="list-style-type: none"> Egyptian hotels need more care regarding the effectively implement of adequate SART. 	Quality assurance	implement of adequate SART
<ul style="list-style-type: none"> Egyptian hotels need more care regarding improving employees' skills regarding SART. 	Training department	Training and improving employees' skills regarding SART.

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تأثير استخدام أتمتة الخدمة والتقنيات الروبوتية (SART) في الفنادق المصرية

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المخلص

مقدمة: أصبحت أتمتة الخدمة والتقنيات الروبوتية من أهم التقنيات الاستراتيجية للضيافة لإرضاء الضيوف والسلامة والوقاية من العدوى، وتنمية معرفة الموظفين وكفاءتهم في صناعة الضيافة.

الأهداف: دراسة تأثير استخدام أتمتة الخدمة والتقنيات الروبوتية (SART) في الفنادق المصرية من خلال تسليط الضوء على أهمية أتمتة الخدمة والتقنيات الروبوتية في الفنادق المصرية وسياستها في تحويل العاملين إلى أهمية أتمتة الخدمة والروبوتية لضمان رضا النزلاء وسلامتهم.

المنهجية: تم إجراء مسح على (28) فندقاً مصرياً من فئة الخمسة نجوم في القاهرة والغردقة وشرم الشيخ "مع مديري الفنادق ورؤساء الإدارات والمشرفين والموظفين تم إجراؤه بشكل أساسي من خلال استبيان تم إدارته ذاتياً عن طريق الزيارات الشخصية والمكالمات الهاتفية والإنترنت والبريد الإلكتروني والفاكس. ركز الاستبيان على وجهة نظر الإدارة والمشرفين والموظفين حول أتمتة الخدمة والتقنيات الروبوتية كأداة لزيادة رضا الضيف وكذلك السلامة والوقاية من العدوى في مصر، تم استخدام البيانات التي تم جمعها من عينة الفنادق المختارة. تم عمل تحليل وصفي للاستبيان باستخدام الإصدار 20 من SPSS.

النتائج: أظهرت نتائج المساهمة الرئيسية لهذا البحث أن فاعلية أتمتة الخدمة والتقنيات الروبوتية في تقييم القرارات، وزيادة رضا النزلاء في الفنادق المصرية، وكذلك السلامة والوقاية من العدوى. التوصيات: أوصت الدراسة بالحاجة لتطبيق أتمتة الخدمة والتقنيات الروبوتية في الفنادق المصرية. لذلك، يجب أن تكون الإدارة حساسة لأتمتة الخدمة وتطبيقات التقنيات الروبوتية التي كانت جارية بالفعل داخل الفنادق وتبحث عن وسائل لدعمها. يجب أن توجه إدارة الفنادق في مصر بعض ميزانياتها لأتمتة الخدمة والتقنيات الروبوتية.

معلومات المقالة

الكلمات النهائية

أتمتة الخدمة؛ التقنيات الروبوتية؛ رضا الضيف؛ التسويق المتمحور حول العميل؛ السلامة ومكافحة العدوى.

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