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TOURISTS AWARENESS OF SERVICE ROBOTS IN THE HOSPITALITY INDUSTRY IN NIGERIA

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Abstract

The study examined tourist awareness of service robots in the hospitality industry in Nigeria. The specific objectives were to: investigate tourists' awareness of security robots in the hospitality industry, investigate tourists' awareness of customer service robots in the hospitality industry, assess tourists' awareness of domestic robots in the hospitality industry, and investigate tourists' awareness of frontline service robots in the hospitality industry. This study adopted the cross-sectional research design the population for this study comprised of tourists who made use of hotel establishments while visiting Calabar from 2015 to 2018. Primary source of data was adopted for this study. The data collected through distributed questionnaire copies were presented in frequency tables and simple percentages were used to analyze the data. Based on the results, the following findings were revealed thus: hypothesis one revealed that the tourists visiting hotels in Nigeria have a fairly low knowledge about security robot in the hospitality industry. From the test of hypothesis two, it is seen that the tourists' still have a fairly low knowledge about customer service robot in the hospitality industry as seen in the aggregate mean. Hypothesis three reveals that tourist visiting hotels in Nigeria have a fairly low knowledge about the existence of domestic robot as seen in the aggregate mean. Hypothesis four reveals that the tourists visiting hotels in Nigeria have a fairly low knowledge about frontline service robot in the hospitality industry as seen in the aggregate mean. The study concluded that the respondents have a fairly low knowledge about the service robots in the hospitality industry in Nigeria and no experience at all. The study recommended that service, frontline service, domestics and security service robot may not be introduced all at the same time; the firms may start with few just to deepen awareness. Also, recommended that that firms should properly sensitize their customers about the services of robots though short messaging services (SMS), public lecture and advertising to enhance acceptance. Finally, firms that have financial capacity should introduce the operation of service robot in their organisation and give room to receive feedback from clients.

Keywords: Tourist awareness of service robots, tourists' awareness of security robots, tourists' awareness of customer service robots, tourists' awareness of domestic robots, tourists' awareness of frontline service robots, hospitality industry.

Introduction

Robots, since their arrival have increasingly become a discernible part of economic landscapes and daily human life. The activities of robots have mainly been disruptive and interesting. The term robot has in this 21st century been used to refer to computer driven mechanical devices that are smarter than their ancient counterparts and threaten a great deal of economic and social disruption in the not-so-distant future. Living in a time where technology becomes very relevant. A typical example is seen in a 2014 data from the USA indicating that "truck driver" is the most common job in 29 of the USA's 50 states (NPR, 2015) and the robot that is the self-driving truck will almost immediately make these workers

redundant/unemployed (Solon, 2016). Automated machines hold a long history of replacing human labour; a typical example would be in the advent of ATM machines and vending machines that have largely replaced human labour in the hospitality industry and the banking sector. Although advancement in robotics has offered an impressive growth in economic efficiency and technical progress, it is uncertain what the social and economic consequences will be for incorporating it into the economy.

Today, one can envisage human-sized robots with the capacity for near human thoughts and movement, not just simple fixed machines capable of performing manufacturing tasks with little human assistance. Digitally controlled industrial robots using artificial intelligence have been built since the 2000's. In 2015, Henn-na hotel opened in Japan. A hotel with warm and friendly robot staff performing the various functions of regular hotel staff, keyless access to rooms using face recognition technology, motion sensor controlled lighting and other amazing features. This brought to reality what most didn't believe could happen. Although Henn-na hotel laid off half of its robot staff in 2019 and replaced them with human beings (Hertzfeld, 2019), it made it apparent that the age of robots is coming and coming quickly. Hennna hotel is not alone in the race to incorporate robotics into the hospitality industry, hotels like the Hilton hotels, Aloft hotels, Intercontinental hotels, Yotel hotels and Marriott international.

Statement of the Problem

The technological advancement has helped organizations streamline operations, decrease cost, eliminate waste and improve productivity and efficiency, which leads to huge transformations in the way businesses (will) operate (Agrawal, Gans & Goldfarb, 2018; Davenport, 2018; Makridakis, 2017; Talwar, 2015; Talwar et al., 2017). This means the customer should not often expect the face of a human being when they walk into a hospitality facility. The use of robotics has become a widely accepted development in the western world with the likes of Henn-na hotel using it to a wide extent. As rapid as the use of robotics has grown in the western world, the hospitality industry in Nigeria is yet to experience this transformation. This slow adoption of robot technology could be caused by a number of factors one of which is tourists' awareness. This study intends to investigate how aware consumers of the hospitality services in Nigeria are of this technological advancement, which may in the future transform the hospitality industry, as they know it in their community.

Objectives of the Study

The principal objective of this study is to investigate the awareness of tourists to service robots in the hospitality industry in Calabar, Nigeria. The specific objectives include the following:

1. To investigate tourists' awareness of security robots in the hospitality industry.
2. To investigate tourists' awareness of customer service robots in the hospitality industry.
3. To assess tourists' awareness of domestic robots in the hospitality industry.
4. To investigate tourists' awareness of frontline service robots in the hospitality industry.

Research questions

This study is conducted in an attempt to provide answers to the following questions:

1. Are tourists aware of the existence of security robots in the hospitality industry?
2. To what extent are tourists aware of customer service robots in the hospitality industry?
3. Are tourists aware of the existence of domestic robots in the hospitality industry?
4. To what extent are tourists aware of frontline service robots in the hospitality industry?

Literature review and hypothesis development

Theoretical framework

This theory is anchored on stakeholders' theory which was propounded by Preston and Sapienza in 1990. The theory states that the company involves in an environment composed of individuals or individual groups with whom it maintains relationship aiming at making them true partners i.e. who participate in its evolution. These stakeholders are not only shareholders and include the customers, the employees, the suppliers, etc. with the regard of which the firm has responsibilities. This theory states that business model constitutes the base of the entrepreneur's strategic vision, is a crystallization of the relationship with the stakeholders. It states also the question of the governance of the nascent organization since its survival depends on the duration adhesion of these stakeholders, and therefore on the value which is also durably brought to them. For this reason, the entrepreneur must show to the resources holders, he wishes "to embark" in his business, what is the heart of his business, i.e. the model with which he intends to bring the value he will be able to be remunerated for by the market. This model must be sufficiently understandable so that each one recognizes that, indeed, it is a good way of generating value, which a turnover will reward.

CONCEPTUAL FRAMEWORK

Concept of Awareness

Awareness is the ability to directly know and perceive, to feel and to be cognizant of events. More broadly it is the state of being conscious of something. Awareness could also be described as a state when a subject is aware of some information, when that information is directly available to bring to bear in the direction of a wide range of behavioral actions. The concept of awareness is often anonymous to consciousness and is also understood as being consciousness itself. The states of awareness are also associated with the states of experience so that the structure represented in awareness is mirrored in the structure of experience (Solon, 2016).

According to Hertzfeld (2019), awareness is a relative concept, it may be focused on an internal state, such as a visceral feeling or an external event by way of sensory perception. It is analogous to sensing something, a process distinguished from observing and perceiving (which involves a basic process of acquainting with the items we perceive).

Stages of Awareness

Awareness has five stages according to Melisa (2019), these stages include: completely unaware, problem-aware, solution-aware and most aware

Completely unaware

These people don't even realize that they have a problem nor that something better than their current situation exists. They make first contact on social media or with paid ads, where your goal should be to educate them on the problem they've yet to accept.

Problem-aware

They have problem but they don't fully understand it or how it can be solved. This visual content provides some answers and helps the viewer to move towards the next step-the solution

Solution-aware

They know that solutions are out there. They know which products are on offer and they're shopping around, but they are not necessarily sure that your company s, or at least what it offers

Product-aware
This bunch know your offering but they're also aware of your competitors too. They just need to be convinced to pick

Most aware
These people have probably chosen you already and they're very close to a purchase. A cheeky promotion will likely be enough to encourage that final purchase, whether it is a percentage discount, free shipping, a bundle deal, freebles, you name it.

SERVICE ROBOTS
The International Organization for Standardization defines a "service robot" as a robot "that performs useful tasks for humans or equipment excluding industrial automation applications". According to an article on service robots by Ludena and Lobet (2012) robots require "a degree of autonomy", which is the "ability to perform intended tasks based on current state and sensing, without human intervention". For service robots this ranges from partial autonomy - including human robot interaction - to full autonomy - without active human robot intervention. Service robots assist human beings, typically by performing a job that is dirty, dull, distant, dangerous or repetitive, including household chores. They are technical devices that perform tasks useful to the well being of humans in a semi or fully autonomous way (International Federation of Robotics 2015). The differentiation between industrial and service robots is based on their area of application and closeness to end-users (Prestes et al. 2013). Since service robots have to operate and communicate in an unconstrained, human-centred environment, a high degree of autonomy is an inherent characteristic of them (Haidegger et al. 2013).

Types of Robots
Robots can also be classified into pre-programmed, autonomous and tele operated robots.

a) Pre-programmed robots operate in a simple, controlled environment so that they do not require a great deal in the way of intelligent control systems to operate successfully. The most familiar pre-programmed robots are probably the robots used to build cars in most automobile plants around the world.
b) Autonomous robots operate independently of human operators in environments that are not as tightly controlled as pre-programmed robots. They have "autonomy" because it is ultimately the machine's responsibility to detect changes in the environment and to adapt to it. Autonomous robots are used in industry, as labor-saving devices at home, and are even becoming popular toys.
c) Tele operated robots are controlled remotely by a human being. The underwater robots that helped fix the oil leak in the Gulf of Mexico were tele operated. The robotic arm on the Space Shuttle is another example.
   Some robots are connected directly to the human user's body, either by the user gripping the controls in their hand or by having it in contact with the user's body in some other way. Movements of the users body (sometimes it is only the mental activity of the user's brain) ultimately control a robotic effector of some kind. These robots can either enhance the user's natural skill in some way (e.g., extending their reach) or give them a skill they don't have or have lost (e.g., a robotic prosthetic arm).

Types of Service Robots

- **Security service robots**

Security service robots are autonomous security machines which are meant to augment security and law enforcement with the tools of modern information technology, equipped with facial recognition database and other important data. These robots bridge the gap

between traditional security measures such as cameras, access controls and manned guards. Some security robots have night-vision-capable wide-angle-camera that detects movements and intruders and can patrol paces and shoot videos of suspicious activities, and send alerts via emails or text message. They can be configured to go into action at anytime of the day.

- **Customer service robots**

Customer service robots are professional service robots intended to interact with customers. These robots come in humanoid and non-humanoid forms and automate much of the most basic of tasks in customer service. Most customer service robots are used to assist customers in finding an item or completing a task. Their true value lies not only in their ability to interact with customers more cost-effectively than their human counterparts, but their ability to collect consumer data during face to face interactions.

In this way customer service robots have a major potential for developing interactive marketing and re-branding strategies and for the tracking and analytics of customer behavior. They can be found in banks, shopping malls, family entertainment centres and hospitality facilities.

- **Domestic service robots**

A domestic service robot is an autonomous service robot that is primarily used for household chores. There are two types of domestic service robots; indoor service robot and outdoor service robots. The indoor domestic robot does chores around and inside the house. Different kinds include: robot vacuum cleaners, floor washing robots, and laundry robots. Outdoor domestic robots include robotic lawn mower, automated pool cleaners and window cleaning robots.

- **Front line service robots**

Frontline service robots are autonomous service robots that are intended to interact with customers and perform the frontline services of the hospitality industry. These frontline service robots could perform duties such as that of a receptionist or a concierge.

Robots in Hospitality and Tourism

The application of robotics in the hospitality industry is an area of research that is not entirely new but also has not been sufficiently explored in India (Iboyo & Akinruwa,2013)). With most of the research work aimed at announcing the arrival of the robots, examining its current and potential usage and trying to understand the effects it would have on the economy, the labour force and general human well being, it is safe to say the idea is no longer strange. Friendly and generous human-to-human interaction is at the core of good hospitality whether at a hotel, restaurant or club. However, the hospitality industry is fast changing and machines replace human workers. In the developed world some big hotels have already begun to replace front desk staffs with self check in kiosks in attempt to be more efficient and cut down check in wait time for guests (Iboyo and Akinruwa,2013). There are also attempts to have robots that take advantage of consumer behavior to suggest products or services to guests visiting hospitality establishments. A typical example will be a robot suggesting the same brand of wine the guests had during their previous visit. The CEO of Accor hospitality group SébastienBazin in an article written by Ludena and Lobet (2012) states clearly his lack of support for the use of robots in the hospitality industry especially in facilities belonging to Accor. “I don’t like it because I really believe the human touch makes the difference in the hotel space,” he said. While some fear that this innovation will make the hospitality industry lose is human touch and are completely against the idea, others embrace it whole heartedly. A typical example of this acceptance would be the Henn-na Hotel, its appearance with a record breaking number of robot staffs, the hotel felt like the future most authors speak of. Robots handled check-in, concierge, room service as well as other hotel services with a few human staffs ensuring that the robots were charged and intervening when a malfunction occurred.

However the tale came to an end with the management having sacked a good number of their robot staff and replace them with humans. There were several complains by guests saying they will prefer humans to handle their request. This made it rather clear that we are not ready for full-scale automation in the hospitality industry. While await and work towards this future with full scale adoption of automation, it is pertinent that certain structures be put in place. Ivanov and Webster (2018) investigates how hospitality firms (e.g. hotels, restaurants, bars, etc.) need to (re)design their facilities in order to make them accessible for robots. Their paper emphasises that robot- friendliness of facilities would be a new source of competitive advantage for hospitality companies in the future. The key components to consider are; external and internal physical accessibility of the premises, power related issues, safety and security issues, repair facilities for robots, digital map for robot navigation, recognition of staff, guests, delivery service, and others. The adoption of robots is dependent on the labour and technology costs, customers' readiness and willingness to be served by a robot, cultural characteristics of both customers and service providers, the technological characteristics of robots and other factors. Although the developed world is fast advancing in the use of robots, developing countries such as Nigeria. The use of robots in the hospitality industry comes with its pros and cons. The pros are; efficient and productive work round the clock, the presence of robots be-ring a certain excitement and publicity that help brand image and they eliminate human error with their precision and accuracy. The cons however are; the presence of some technical glitches, security of data gathered by robots cannot be guaranteed and accessibility to this technology is very expensive.

RESEARCH METHODOLOGY

Research design, population and sample

This study adopted the cross-sectional research design in Calabar, the capital of Cross River State, a port city in southern Nigeria, near the Cameroon border. The town of Calabar, a popular tourism destination nicknamed "Canaan City" or "the Peoples' Paradise" occupies a landmass of 406km2 and is bordered to the North by Odupkani Local Government Area, the South by Bakassi Local Government Area, and West by the Atlantic Ocean. The target population for this study comprised of tourists who made use of hotel establishments while visiting Calabar from 2015 to 2018. The Cross River State Tourism Bureau Statistical Report(2014 put the total number of tourists to Calabar at the end of 2013 at eight hundred thousand (800,000). The expected tourist growth rate according to the bureau is 3.0 percent. Therefore, the projected population for tourists as at 2018 is calculated as follows:

Pp = (kp.r/d)t + kp Where; Pp= Projected population kp = Known population r/d = Population growth rate, t = Time interval between the base year and projected year. Thus; kp = 800,000 r/d = 3.0 percent, t = 5 years
Substitute;
(800,000 x 0.3) 5 + 800,000
= (240,000) 5 + 800,000
= 1,200,000 + 800,000
= 2,000,000

Therefore, the projected population of tourists who used hotel establishments while visiting Calabar as at 2018 is 2,000,000. The sample size was determined using the Taro Yamane formula for known population, this was employed with an error margin of 5 percent, and the sampling technique adopted for this study was the convenience sampling technique.

Method of data collection
Primary source of data was adopted for this study. The collection method for the primary data was through administration of questionnaire.

Validity and reliability of instrument
The content validity method was used to ascertain the validity of the research instrument, using a pilot survey instrument the researcher subjected 30 tourists to a test-retest. To accept the instrument as reliable, the reliability test gave a result of 0.7, which indicated a high reliability rate.

Data treatment technique
The data collected through distributed questionnaire copies, were presented in frequency tables and simple percentages were used.

RESULTS AND DISCUSSION

Data analysis
The outcome of the responses shows that out of the 386 respondents, 228 (59.1 percent) were males while 158 (40.9 percent) were females. The age distribution of the respondents revealed that11 respondents (2.1 percent) were within 18 to 24 years of age, 114 respondents (96.5 percent) were within 25 to 31 years of age; 112 respondents (29.0 percent) were within 32 to 38 years; 95 respondents (24.6 percent) were within 39 to 45 years of age; and 57 respondents (14.8 percent) were aged 46 years and above. Further, the table showed that the highest academic qualification. None of the respondents was Senior School Certificate holder (SSCE); 28 respondents (7.3 percent) were holders of Ordinary National Diploma (OND) or National Certificate in Education (NCE), 307 respondents (79.5 percent) are holders of Higher National Diploma (HND) or Bachelor of Science degrees (B.Sc.), 51 respondents (13.2 percent) are holders of M.Sc, MBA or Ph.D. Lastly, the marital status of the respondents showed that 87 respondents (22.5 percent) were single, 270 respondents (69.9 percent) were married; 11 respondents (2.8 percent) were divorced while 18 (4.7 percent) were either widows or widowers.

RESULTS

Objective One
To investigate tourists' awareness of security robots in the hospitality industry.

Table 1
The mean scores on the awareness of security robot in the hospitality industry

Parameters use for rating the mean.	Mean	N	Standard Deviation
I have heard of security robots.	2.79	386	1.829
I have seen a security robot.	1.17	386	.574
I have been served by a security robot.	1.19	386	.584
I would like to be served by a security robot.	3.88	386	1.544
Aggregate mean	**2.26**	**386**	**.760**

Source: SPSS output, 2019

Table 1 shows the mean score on the awareness of security robot in the hospitality industry. The mean score for the first statement in the table is 2.79, this shows that respondents have heard about security robot. The mean score for the second statement (1.17) shows that most of the respondents have not seen a security robot before. The mean score for the third statement (1.97) shows that most of the respondents have not been served by a security robot. The mean score for the last statement in the table shows that majority of the respondents are anxiously waiting for the service of a security robot, this is seen with the very high mean score for that statement (3.88).

Objective Two

To investigate tourists' awareness of customer service robots in the hospitality industry.

Table 2

The mean scores on the awareness of customer service robot in the hospitality industry

Parameters use for rating the mean.	**Mean**	**N**	**Standard Deviation**
I have heard of customer service robots.	2.83	386	1.845
I have seen a customer service robot.	1.16	386	.564
I have been served by a customer service robot.	1.16	386	.566
I would like to be served by a customer service robot.	3.88	386	1.544
Aggregate mean	**2.26**	**386**	**.759**

Source: SPSS output, 2019

Table 2 shows the mean score on the awareness of customer service robot in the hospitality industry. The mean score for the first statement in the table is 2.83, this shows that respondents have heard about customer service robot. The mean score for the second statement (1.16) shows that most of the respondents have not seen a customer service robot before. The mean score for the third statement (1.16) shows that most of the respondents have not been served by a customer service robot before. The mean score for the last statement in the table shows that majority of the respondents are anxiously waiting for the service of a customer service robot, this is seen with the very high mean score for that statement (3.88).

Objective Three

To assess tourists' awareness of domestic robots in the hospitality industry.

Table 3
The mean scores on the awareness of domestic robot in the hospitality industry

Parameters use for rating the mean.	Mean	N	Standard Deviation
I have heard of domestic robots.	2.77	386	1.833
I have seen a domestic robot.	1.19	386	.582
I have been served by a domestic robot.	1.19	386	.584
I would like to be served by a domestic robot.	3.86	386	1.559
Aggregate mean	**2.25**	**386**	**.768**

Source: SPSS output, 2019

Table 3 shows the mean score on the awareness of domestic robot in the hospitality industry. The mean score for the first statement in the table is 2.77, this shows that respondents have heard about domestic robot. The mean score for the second statement (1.19) shows that most of the respondents have not seen a domestic robot before. The mean score for the third statement (1.19) shows that most of the respondents have not been served by a domestic robot before. The mean score for the last statement in the table shows that majority of the respondents are anxiously waiting for the service of a domestic robot, this is seen with the very high mean score for that statement (3.86).

Objective Four

To investigate tourists' awareness of frontline service robots in the hospitality industry

Table 4
The mean scores on the awareness of frontline service robots in the hospitality industry

Parameters use for rating the mean.	Mean	N	Standard Deviation
I have heard of frontline service robots.	2.73	386	1.844
I have seen a frontline service robot.	1.17	386	.574
I have been served by a frontline service robot.	1.19	386	.584
I would like to be served by a frontline service robot.	3.90	386	1.544
Aggregate mean	**2.25**	**386**	**.764**

Source: SPSS output, 2019

Table 4 shows the mean score on the awareness of frontline service robot in the hospitality industry. The mean score for the first statement in the table is 2.73, this shows that

respondents have heard about domestic robot. The mean score for the second statement (1.17) shows that most of the respondents have not seen a frontline service robot before. The mean score for the third statement (1.19) shows that most of the respondents have not been served by a frontline service robot before. The mean score for the last statement in the table shows that majority of the respondents are anxiously waiting for the service of a frontline service robot, this is seen with the very high mean score for that statement (3.90).

Discussion of findings

The mean result reveals that the tourists visiting hotels in Nigeria have a fairly low knowledge about security robot in the hospitality industry. This is seen in the aggregate mean score which is 2.26. This finding is in tangent with the study of Melissa**Bolton (2019) which says *that*** *the prospect (tourist) is not completely aware of all the product does, or he is not convinced of how well it does what it does or has not yet been told how much better it does it. This implies that tourist in Calabar have limited knowledge about security robot and how well it works in the hospitality industry this why they are unable able to demand for it to be used in the various hotels in Calabar.*

From the mean resuult, it is seen that the tourists' still have a fairly low knowledge about customer service robot in the hospitality industry as seen in the aggregate mean for this hypothesis (2.26). This finding is in sharp contrast with the study of Ivanov, Webster and Garenko (2018), which revealed that young Russians will be quite supportive to the introduction of service robot in the hotel industry and this is as a result of their level of awareness and technology advancement. This implies that due to the low level of awareness of tourist in Calabar about customer service robot, they may not accept it services if introduced.

The mean table also reveals that tourist visiting hotels in Nigeria have a fairly low knowledge about the existence of domestic robot as seen in the aggregate mean for this hypothesis (2.25). This finding is in consistent with the study of Ludana and Llobet (2012) **which says that** *consumers face choice set which evolve according to the awareness of each product, the awareness process can be significantly sped up by advertising. This implies that the firms' in the industry can deploy the promotional tool, advertising to help raise awareness of service robot within the hospitality industry in Calabar.*

The mean table shows that the tourists visiting hotels in Nigeria have a fairly low knowledge about frontline service robot in the hospitality industry as seen in the aggregate mean for this hypothesis (2.25). The finding is in tandem with the study of Ibojo and Akinruwa (2014) which concluded that promotion is a vital and critical factor that enhances product awareness in the market. Hence, promotion attracts attention particularly when consumers are not familiar with the product. This implies that the tourists' can accept the services of frontline service robot if adequate promotion is done by the firms.

CONCLUSION AND RECOMMENDATIONS

The study examined tourist awareness to service robots in the hospitality industry in Nigeria. The quality of services offered by the firms in the hospitality industry and the technology used to deliver these services by playing a significant role on the level of patronage by the customers (mostly tourist). Four objectives were used as cardinal point in which the study was centred on and there are; to investigate tourists' awareness of security robots in the hospitality industry, to investigate tourists' awareness of customer service robots in the hospitality industry, to assess tourists' awareness of domestic robots in the hospitality industry and to investigate tourists awareness of frontline service robots in the hospitality industry. An extensive literature review was carried out with relevant studies reviewed empirically. A well structured questionnaire was deployed to sample opinion and also

generate information from respondents, mean rating was the statistical tool that was used to test the hypotheses. The results showed that the respondents have a fairly low knowledge about the service robots in the hospitality industry in Nigeria and no experience at all.

Based on the above findings, the following recommendations were made:

- Customer service, frontline service, domestics and security service robot may not be introduced all at the same time; the hospitality firms may start with few just to deepen awareness.
- Hospitality Firms should properly sensitize their customers about the services of robots though short messaging services (SMS), public lecture and advertising to enhance acceptance.
- Hospitality firms that have financial capacity should introduce the operation of service robot in their organisation and give room to receive feedback from clients.
- Hospitality firms in the industry could leverage on influencers and host educational and social events in order to raise awareness of service robots.

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