CUSTOMER PERCEPTIONS OF SERVICE ROBOTS IN PROVIDING SERVICES: THE ROLE OF EMOTIONAL INTELLIGENCE FOR CUSTOMER SATISFACTION

Valentina Hurtado Uribe, Missouri State University
Ismet Anitsal, Missouri State University
Melek Meral Anitsal, Tennessee Tech University

ABSTRACT

The worldwide exponential growth of technology and artificial intelligence (AI) associated with robotization, the globalization of markets, and the detriment of the workforce, have made the service industry an attractive sector for emerging technological innovation (Tuomi et al., 2021). Service robots are beginning to perform service deliveries that used to be completed by human employees. The service industry has been recognized for achieving customer satisfaction in any service delivery through the emotional intelligence skills that are naturally given to human employees, so it is expected that the mission of service robots is to maintain this satisfaction in customers (Sayed & Proches, 2021; Torres et al., 2019). Previous research has shown that replacing traditional employees with service robots has generated customer dissatisfaction and decreased quality-of-service provision. Although high technology and artificial intelligence have taken over service robots, the lack of emotional intelligence skills in service robots has hindered their popularity from customers' perception. (Paluch & Wirtz, 2020; Park & del Pobil, 2013).

The purpose of this current study is to explore the importance of the customer-machine relationship in the provision of services and the role that emotional intelligence plays in the perception of customers. It reviews the literature on the importance of emotions in the service industry and offers three propositions. The literature review indicates that, despite the natural abilities given to clients, they prefer to delegate the execution of repetitive tasks to robots. The development of social/emotional skills in service robots is essential to fit into the service industry and maintain the social status of service robots by providing customer satisfaction. Once these social/emotional skills, technological advances, and artificial intelligence enhancements are fully developed in robots, the impact on customer and employee perception will likely be more substantial.

INTRODUCTION

The beginning of the industrial revolution, at the end of the 18th century, revealed the capacity of technology to change and evolve rapidly. Humanity experienced several technological miracles during this time that brought various lifestyle changes. Steam engines appeared in factories, awakening the manufacturing sector, particularly in the agricultural and

textile industries. Production lines were implemented that managed to streamline production and replace part of the workers, also lowering costs (Sorooshian & Panigrahi, 2020). Human capital, for its position, seemed to be threatened, although the benefits of systematization were impressive in the economy of the time. In 1869, the rate of production per hour in the United States increased by 1.6% over previous years (Wirtz et al., 2021).

Technology has driven rapid change and constant evolution. Communication went from letters to emails, from horse-drawn carts to electric cars. Commerce went from physical in the markets to virtual on platforms like Amazon or eBay. Business interactions have evolved to the point of closing a deal with a single click. Software development has improved, as well as features such as voice recognition and commands for various applications for both corporate and consumers (de Kare-Silver, 2020). Examples include AI-powered voice assistant devices such as Google's Google Assistant, Apple's Siri, Amazon's Alexa, Samsung's Bixby, and Microsoft's Cortana (Klein et al., 2020).

Artificial intelligence can be used to automate business processes where algorithms independently complete their scheduled tasks without human intervention. For example, it is possible to predict customer behavior and make personalized recommendations based on past behavior patterns (Paluch & Wirtz, 2020). The World Economic Forum predicts that robotization and process automation will cause the loss of low-skilled jobs. It is estimated that almost 50% of companies will reduce their human capital in the coming years due to automation. And 47% of current jobs will be obsolete in two decades because mechanized work will be prioritized over humanized work (León Llorente, 2020).

While the use of industrial robots has a long tradition in manufacturing industries, there is a more recent phenomenon known as service robots (Ott et al., 2021). Service robots are anticipated to affect various sectors, especially those industries that rely heavily on repetitive manual labor, which tends to be of low cognitive and emotional complexity. These will be the first to feel the impacts of impending automation. For example, in the transportation industry, it would be possible to install a hologram-based service robot inside an airport to help passengers and answer common questions in all languages (e.g., providing arrival and departure information and directions to get to check-in counters for a particular airline), tasks that would typically require multiple employees (Wirtz et al., 2021).

The social and labor scenario is currently facing critical challenges: the aging of the population and the abandonment of the labor market. According to the European Center for the Development of Vocational Training, 80 million jobs will be created in the coming years (León Llorente, 2020). The exponential growth of technology associated with robotization, the globalization of markets, and dependence on human work make the service industry attractive for emerging technological innovation. For example, several hotels have replaced service personnel in Japan with interactive robots. While in the UK, there is a growing interest in investment in the food technology sector, particularly restaurant robotics (Tuomi et al., 2021).

The combination of artificial intelligence and service robots will likely transform service sectors and lead to rapid innovation, potentially improving customer experiences with better service quality, reducing costs, and increasing productivity simultaneously (Belanche et al., 2020). Abuselidze and Mamaladze (2021) expected artificial intelligence to become a $118.6

billion industry by 2025. And Wirtz et al. (2021) predict that the market size of service robots will reach $41.5 billion by 2027. The latest advances in AI and automation allow robots to sense and respond to their environments, thus expanding their versatility in moving through industries such as hospitality, transportation, restaurants, customer service, and delivery. Service robots can analyze large volumes of data, integrate information, recognize patterns, relate them in minutes, propose the most appropriate solutions, and make precise recommendations (Paluch & Wirtz, 2020; Wirtz et al., 2021).

Despite the rise of service robots, some people still have difficulty including robots to perform tasks (Park & del Pobil, 2013). The Henn-na Hotel in Japan opened its doors in 2015 and is operated entirely by service robots. Dissatisfaction among the users began to grow due to issues such as lack of knowledge and the annoying noises that the robots generated, forcing the hotel management to involve human personnel in its first line to deal with the robots and guests (Paluch & Wirtz, 2020). Dealing with emotions is considered an unskilled task that is difficult for robots as it goes beyond a superficial behavioral display. Particularly complex and emotionally demanding tasks are still best handled by human service employees, as they can generate genuine emotions such as enthusiasm and joy or empathy and compassion in the service encounter, something that technology is still developing (Wirtz et al., 2021).

In a service environment, there is a strong link between the emotions of employees and customers. Understanding and managing customer emotions is imperative to providing good customer service, as emotions influence customers' decisions (Sayed & Proches, 2021). Emotional Intelligence (EI) represents an essential element in connecting feelings and emotions. Emotion is a state of mind of short and intense duration that works as an automatic defense system and is sensitive to an internal or external stimulus and sometimes could affect the individual's reaction ability. EI involves some essential skills in any human relationship, such as perceiving emotions, expressing, knowing, understanding, and regulating them, promoting emotional and intellectual development (Anderlová & Pšurný, 2020; Dambean, 2021)

This research aims to explore the factors that prevent robots from replacing humans in the service industry, as well as the factors that induce the tendency to reject service encounters led solely by service robots. Emphasizing the importance of emotional intelligence and human-robot interaction in the service industry from a superficial vs. genuine behavioral display will be assessed.

LITERATURE REVIEW

Emotions and Emotional Intelligence (EI)

The recognition of emotions and regulating them are essential in the service industry. Employees are constantly dealing with customers' positive and negative emotions, so it is necessary to control them to deliver a positive service experience. For example, customer service agents have a challenging job because their environment is often loaded with customers' negative emotions and dissatisfaction with the service. Emotions tend to be contagious, so the employee's mission is to regulate the customer's emotions, seeking to transform them into positive ones (Ribeiro & Prayag, 2019; Widdershoven et al., 2021). This ability to regulate emotions is known

as emotional Intelligence (EI). EI can be defined as the ability to perceive, analyze, express, and control emotions, generating empathy and promoting emotional and intellectual growth (Mayer & Salovey, 1997, p.10), mentioned by (Gutiérrez-Cobo et al., 2018). It is necessary for service industry employees to have well-developed emotional intelligence skills to manage multiple customer backgrounds with different needs and provide quality service, typical of the service sector (Sayed & Proches, 2021).

Emotions are integral components of the human brain's nervous system that are reflected in the form of variations such as in the tone of voice, body gestures, written or facial expressions, and in their daily behavior as a result of eliciting events from external or internal factors (Thompson, 2013; Sayed & Proches, 2021). The psychological literature has several theories about emotions. Izard (1977; p. 43) presents his theory where he affirms the existence of ten fundamental emotions, seven negatives, two positives, and one neutral. Their combinations create a great variety of emotions, constituting the human motivational systems necessary for survival. Other authors, such as Plutchik (1980; p. 8-9), postulate the theory of the existence of 8 primary emotions, which Izard would call fundamental, and are distributed as four negatives, two positives, and two neutral. Both authors agree that all other emotions are mixtures of primary or fundamental emotions and that these have the capacity to adapt (Gilbert et al., 2021).

The adaptability of emotions could be transferred to the market, particularly to customers. When a customer experiences a service encounter, a set of emotions are elicited, denoted as consumption emotions (Song & Qu, 2017). Consumption emotions tend to influence aspects such as decision-making, which Ribeiro and Prayag (2019) identified as pre-purchase or post-consumption decisions, which also represent outputs of customer behavior (Ribeiro & Prayag, 2019; Richins, 1997). The marketing literature has grappled with understanding customer behavior for years concerning the customer experience, especially during service encounters. For their part, Lemon and Verhoef (2016) point out that the client's experience is determined by a series of contact points that can provoke positive or negative cognitive and affective evaluations; that is, the client's experience affects their own emotions, customer satisfaction, and thus its behavior (Lemon & Verhoef, 2016; Ribeiro & Prayag, 2019; Richins, 1997).

Customer Satisfaction in Service Encounters

The service industry has stood out for providing memorable experiences to customers, inducing their satisfaction and loyalty. Providing quality service is one of the most effective initiatives to affect customer attitudes positively. Frontline employees oversee this during a service encounter (Prentice et al., 2022; Torres, Wei et al., 2019). For instance, the hospitality sector highly depends on the employee's performance during service delivery. In nursing homes, personal encounters between service providers such as caregivers, nurses, and doctors with geriatric customers play a crucial role in customer satisfaction. Positive customer experiences in senior homes seem to come from these social interactions and emotional displays with each other, minimizing loneliness and depression. Employees recognizing facial expressions and understanding emotions can help the customer to develop interpersonal abilities such as empathy and trust (Koc & Boz, 2020; Prentice et al., 2022).

The service industry has considerably grown during the last decades, especially since the industrial revolution in the 18th century. Academics in North America and Europe are taking a new approach to services, viewing them as part of science for their ability to invigorate the economy since, in the US alone, about 80% of workers work in the service sector (Günay & Kurtulmuş, 2021; Holusha, 1989). The impact of the service industry on the world economy and the constant technological innovation have pushed this sector to reinvent itself constantly. Technology combined with Artificial Intelligence (AI) development has bet on bringing top-of-the-line robots from factories to the service industry to compensate for labor shortages, improve the service experience, and reduce operating costs, goals that the marketing field has been fighting with for years in order to increase customers' standard of living (Fusté-Forné & Jamal, 2021; Sorooshian & Panigrahi, 2020; Wirtz et al., 2021).

Artificial Intelligence (AI) in Service Industry

The artificial intelligence concept was introduced by the Dartmouth Research Project to design an intelligent machine that is capable of behaving like a human being (Di Vaio et al., 2020). Expectations from such a machine were correctly interpreting external data, learning to reach specific objectives, and being flexible. Canhoto and Clear (2020) define AI as the technology that can collect, process, and act on data and learn from this process to be able to adapt to changes like humans do. The last decades saw an acceleration in the momentum of AI research and its applications in various disciplines, from space explorations to health.

Artificial intelligence and technology can cheaply execute mechanical, repetitive tasks without room for human error. Thus, some authors such as Frey and Osborne (2017) estimate that up to 47% of US jobs will be vulnerable to automation disrupting service jobs, and service workers will gradually be replaced by robots in the future. (Koster & Brunori, 2021). Traditional full-staff services within the service industry, for example, have been threatened by technology due to the low cognitive and emotional complexity required for the activities carried out there, such as transporting objects and performing tasks monotonous assembly work (Anitsal et al., 2002; Wirtz et al., 2021). In the United States, for instance, a robot has already been developed to cook complex meals and serve customers by replacing an entire staff of employees. (Fauteux, 2021; Koster & Brunori, 2021; Tuomi et al., 2021).

Customers can display multiple emotions based on their human capabilities. EI is considered as the ability to analyze and regulate human emotions and display them (Mayer & Salovey, 1997), which is part of social/emotional skills. Social/Emotional and Cognitive/Analytical skills are examples of customers' mental capabilities that together must function correctly. Abilities such as verbal explanation, listening skills, self-control, and emotional regulation are part of the Social/Emotional skills humans develop from early childhood, as well as Cognitive/Analytical skills such as memory information retention, information processing speed, and logic to solve problems (Liu et al., 2015; Manivannan, 2019). Skills that have begun to be adopted in technology and AI to perform through robots. The evaluation of the state of research leads us to our first proposition.

P1: Customers can perform complex tasks because they have cognitive/analytical, social/emotional, and physical skills, but they may prefer to perform simple tasks and leave repetitive tasks to technology and service robots once they are convinced that they can trust the artificial intelligence that has shown signs of emotional intelligence.

The service industry is being hit by a wave of automation, artificial Intelligence (AI), and service robots. Now, it is sought that service robots also serve in services that require developing highly cognitive, analytical, and physical tasks within service encounters. Such as assisting in medical surgery through voice-activated robotic arms or humanoid robots in higher education that introduce lessons, offer short games to the students while carrying on quizzes through Google Forms, and summarize the lesson (Fusté-Forné & Jamal, 2021; Guggemos et al., 2020; Wirtz et al., 2021). Robots are taking a prominent role in customer service during and after COVID-19, while isolation and restrictions imposed forced service companies to reinvent themselves. Hotels, hospitals, and other companies in the service industry began to replace their frontline employees with service robots. Free virtual assistants like Hyro have been developed, which, through AI and technology, help healthcare companies and their patients assist them with information in the face of customer questions and enable employees to regulate the growing flow of online services users (Abuselidze & Mamaladze, 2021; Paluch & Wirtz, 2020).

With the recent popularity of artificial intelligence (AI) technology and human-robot interaction, the service robot market has grown and is expected to exceed $30 billion (USD) by 2024 and 41.5 billion (USD) by 2027 (Belanche et al., 2020; Wirtz et al., 2021). Robot integration in society is growing increasingly, which brings up the theory of replacing human work with AI and automation. The Spanish Association of Hotel Managers predicts that by 2023 and 2029, at least 96% of hotel receptionists and 42% of servers in hotels, respectively, will be replaced by autonomous machines and service robots (Belanche et al., 2020; Jia et al., 2021). Despite the great reception that robots have had in the service industry, until today, these autonomous machines effectively perform mechanical and analytical tasks that require, for example, memorization, leaving to human employees' performance of intuitive and empathetic tasks that require judgment and diplomacy, in order to maintain customer service satisfaction typical of the service industry (Dautenhahn, 2001; Jia et al., 2021).

The hospitality sector, for instance, has been a pioneer in robot service adoption. Henna Hotel opened its doors in 2015 in Nagasaki, Japan, with a squad of robots that would help overcome the labor shortage in the rural area where it is based. Guests could find anything from robots at the front desk helping with check-in to robot bellhops transporting luggage to guest rooms (Shead, 2019; Wirtz et al., 2021). The hotel owners wanted to use the robots for everything from making drinks to answering all guest queries. Complex social/emotional tasks naturally began to be demanded by guests, but the robots were not advanced enough to perform many of the tasks guests wanted(Paluch & Wirtz, 2020). Guests started complaining about the lack of knowledge of the frontline robots and the disturbing noises in the middle of the night made by robots-employees due to confusing commands. Robots created more problems than they could solve, forcing managers to lay off 243 robots and bring back frontline human staff in order to keep customers satisfied (Hertzfeld, 2019; Jia et al., 2021).

Service robots are embodiments of the technology and AI created to perform customer service tasks autonomously without human assistance. During any service encounter, customer satisfaction is a primary expected result (Belanche et al., 2020; Prentice et al., 2022; Sayed & Gerwel Proches, 2021). The human-robot interaction is needed to comfort the customer, thus forming a relationship based on emotions and emotional intelligence. Therefore, to achieve comfort and customer satisfaction, the service robot must seek an ideal connection with the customer (Bhagya et al., 2019; Hou et al., 2021). Service robots must be able to reason about customer preferences during the service encounter to achieve affinity. Reasoning based on customer preferences is sound when the commands requested by the customer are not well specified, incomplete, or contradictory. Preferences are based on the customer's history but not what is programmed into the robot. Logic programming can be extended to handle preferences by adding priorities to programmed rules. Preferences are nullable knowledge, as they can be reviewed and updated over time, just like service robots (Bhagya et al., 2019; Navarro et al., 2015; Torres, Hernández et al., 2019).

For example, if a customer asks the service robot to bring him a cola drink, the robot's programming knows that there are healthier options instead of the drink and suggests an iced tea to the customer. In this situation, there may be several reactions. First, the service robot explains the reason for the iced tea suggestion based on its programmed cognitive/analytical capacity, nutritionally informing the customer and explaining the health implications of the cola so the customer reasons and agrees with the robot's suggestion. Second, the customer is dissatisfied with the robot's service because the customer's preferences and requests are not considered when he is denied a cola; therefore, customer satisfaction with the service decreases, and the human-machine relationship looks broken. Third, the robot can reason about the customer's preferences over and above its cognitive/analytical programming and provides cola at the customer's request, thus generating customer satisfaction with the service.(Bhagya et al., 2019; Torres, Hernández, et al., 2019). In an ideal world, reasoning with the robot about the customer's preference would be the ideal way to maintain a close human-robot relationship since it shows empathy with the customer. The current development of service robots lacks social/emotional intelligence. Thus, the most probable answer scenario in the example would be decreased customer satisfaction due to a lack of robot empathy toward customer preferences.

> *P2:* *Service robots cannot perform socially/emotionally complex tasks because they lack social/emotional skills, making close human-robot interaction difficult. Even though service robots do not have preferences like humans, they have restrictions as they are programmed. The availability of neutral training sets to program robots in various service settings is critical for their acceptable performances.*

The customer's commands, instructions, status, or situation infer the conformity task that needs to be performed by the service robot. Once the necessary information is provided, the service robot generates a highly relevant and task-oriented service delivery. Robots learn from the information provided by the customer in past interactions, creating a history to improve their responses and adjust their tasks (Kim & Yoon, 2014; Torres, Hernández, et al., 2019). Customer preferences have driven improvements in service robots' design features. Traditionally, robots

were designed for simple tasks that require little cognitive and emotional complexity, such as positioning objects and performing monotonous assembly work. Now, it is sought that service robots also deliver services that require developing highly cognitive, analytical, and physical tasks within service encounters, such as assisting in medical surgery through voice-activated robotic arms, welcoming guests in hotel lobbies, carrying luggage to the guest rooms and even entertaining them (Fusté-Forné & Jamal, 2021; Wirtz et al., 2021).

The interaction between robots and customers is still a field of research. Currently, the interactions during service creation and delivery include conversations with artificial intelligence based on discrete, utilitarian interactions such as basic information or the weather (Choi et al., 2020; Dautenhahn, 2001). When autonomous robots, for example, can interact with natural language and demonstrate behaviors attributable to human qualities, they achieve greater customer acceptance. Facial expressions, voice, and emotions are part of humanlike capabilities that invoke social-psychological processes capable of affecting consumer behavior in different ways, similar to the presence of a human employee (Belanche et al., 2020; Choi et al., 2020; Letheren et al., 2021). The entertainment sector has brought into the industry a concept of a robot called an "animatronic," which physically could be said to look like a human or an animal. Animatronics can mimic simple physical tasks, such as head movements and facial expressions, but do not perform any social/emotional tasks in their interactions with consumers, only performing what they are programmed to do (Otto, 2021; Wiener, 1993). Thus, it is believed that improving social/emotional skills will be vital in improving customer satisfaction with robots.

The affinity and attachment of customers towards machines seem to be more common when similarity is perceived; that is, the robot presents specific, humanlike characteristics (Belanche et al., 2020; Jia et al., 2021; Liu et al., 2022). As well as socio-emotional skills, the robot's physical appearance seems to influence the client-machine interaction positively. A robot's mimicry of physical characteristics of humans, such as eyes, mouth, arms, legs, and gait, or non-physical ones, such as voice, gestures, or personality, increase consumer confidence and influence decision-making related to automation technology (Chuah et al., 2021). Singh and Sellappan (2008) identified a type of robot capable of imitating a human through perception, processing, and action called a humanoid robot. A humanoid robot can be implemented in different environments, from sensitive environments, such as service encounters in the health sector, to harsh environments, such as the defense sector and military use (Chuah et al., 2021; Lyons et al., n.d.; Singh & Sellappan, 2008). While physical human features have already been developed into robots, non-physical human attributes are beginning to be incorporated due to their demand in service encounters to satisfy customers. An example of the incorporation of non-physical human characteristics can be evidenced with Ameca. A UK-based engineering company has developed a humanoid robot called Ameca, which physically resembles a person. Still, it is also capable of expressing human emotions such as surprise, amazement, curiosity, and happiness (Engineered Arts, 2022).

Despite being necessary for the service industry, non-physical characteristics, such as human emotional functions, are challenging to replicate and represent in robots. Humanoid robots are needed to incorporate the ability to show empathy and emotional intelligence and thus maintain the status of social agents in contemporary and future society (Pepito et al., 2020).

Letheren et al. (2021) conducted a study on how a high level of humanity and social interaction influence consumers' tastes toward service robots. The study showed that the scenarios in which the robot could combine verbal and non-verbal communication capabilities in its programming were the most accepted due to the greater opportunity for interaction with the consumer. Humanoid robots must be able to interpret the cause-and-effect relationships that trigger emotions and respond empathetically and appropriately to human sentiments. The implementation of emotional intelligence in service robots will make them seem natural and intuitive, thus improving human-robot interaction (Letheren et al., 2021; Pepito et al., 2020).

Service robots are programmed for friendly interaction with customers, while humanoid robots have the upper hand from the customers' perspective in this interaction. Humanoid robots can help customers with hazardous tasks, such as memorizing data and details (Park, 2020). For example, in Australia, a humanoid robot equipped with an autonomous navigation system and a touch screen has been created to recognize voice commands, give information, and answer questions in the tourism sector. The humanoid robot called Pal Reem offers guided tours through exhibitions and museums. Usually, the tour guides are responsible for providing accurate and up-to-date information (Clunne-Kiely et al., 2017). Humanoid robots are task-oriented since they only consist of the previous programming with the related information. The robots can complete and update information, and their ability to memorize exceeds that of a human employee.

> **P3:** *When fully developed, humanoid robots are likely to combine social/emotional and cognitive/analytical skills to perform more complex tasks in delivering services due to the improvements in technology and artificial intelligence, achieving a more substantial impact on customers and employees. However, cultural differences in the definition of an acceptable service among humans will make robots' learning and training process even more challenging.*

The goal of technological and AI advances is to achieve the adoption of human capabilities by service robots. One of the most impressive innovations in service robots is the development of humanoid robots, which include human appearances such as facial features, arms, and legs (Liu et al., 2022). Humanoid robots currently lack feeling AI and cannot genuinely express emotions, so they cannot fully satisfy customers in the service industry (Chiang et al., 2022). Incorporating emotions and emotional intelligence in humanoid robots is quite a challenge. Song and Kim (2022) found that robots equipped with a human appearance and humanlike social and emotional capacity increase the level of customer trust and acceptance. Humanoid robots are more efficient than human employees in performing complex tasks requiring greater precision and consistency since they leave no room for physical wear and tear and human error. If humanoid robots manage to imitate human social interactions autonomously, just as they do with physical ones, they would be at a higher level than humans in terms of customer satisfaction since there would also be no room for emotional discomfort, which is possible in traditional employees. (Chiang et al., 2022; Letheren et al., 2021).

MANAGERIAL IMPLICATIONS AND FUTURE RESEARCH AVENUES

Technology and AI have advanced to the point of developing emotional intelligence skills in robots, such as the perception, assimilation, understanding, and management of emotions, to achieve the much sought-after genuine and natural human-robot interaction (Chiurco et al., 2022). Robots and customers are needed to develop emotional connections that can overcome current interaction limitations, forming a deeper intimacy. However, Fauteux (2021) states that robots may never experience emotions like humans, creating a constant limit with customers. Chiang et al. (2022) argue that to develop emotional connections, one must have intimacy, which should begin as a companionship process in which the customer's perception is linked to the security and empathy the robot provides. Authors such as Jia et al. (2021), Letheren et al. (2021), and Fauteu (2021) have also identified a close relationship between the positive perception of customers and the level of anthropomorphism of robots.

In addition to their physical similarity to human beings, anthropomorphic robots or humanoid robots have also shown similar psychological states by recognizing customers' facial emotions, movements, or sounds under experimental conditions. The Japanese roboticist Masahiro Mori coined the uncanny valley theory in 1970, as mentioned by Belanche et al., 2020. Mori (1970) proposes that the relationship between anthropomorphism in robots and customer acceptance is based on the human likeness of robots, such as eyes, hair, and skin; however, human likeness can turn comfortless at a certain point. (Song & Kim, 2022). Despite the excellent technological and physical features implemented in humanoid robots, their lack of social/emotional skills, emotional intelligence, and difficulty in expressing themselves naturally and genuinely still prevent them from creating comfort in customers and, therefore, from replacing human employees in the service industry.

In the search to copy humans, the lack of naturalness and genuineness of the expressions of humanoid robots creates fear in customers. For example, a humanoid robot named Pepper was designed to communicate naturally with customers through built-in microphones and a tablet. The humanoid robot can express feelings and sense the emotions of others by detecting the user's facial expressions, voice, and behavior and then responding accordingly. Pepper's tablet also allows him to communicate non-verbally in a much wider variety than any human, for example, by showing colors in his eyes as a sign of emotions; his eyes turn green to deliver happiness and red to show anger. Despite being quite technologically advanced, these types of expressions are still not genuine, which generates customers' insecurity and fear of these expressions. (Chiang et al., 2022; Rozanska & Podpora, 2019).

Japan, South Korea, the United States, and some European countries invested significant funds in robotics research and development, and service robots' popularity has been evident (Ward & Ashcraft, 2010). AI rarely leaves its mark in countries like Brazil, Peru, and Latin America. AI has gained popularity in sectors such as agriculture as an alternative to improve the speed and precision of crop planting techniques, but in the service industry, it does not sound like much. According to Miscion (2015), many people consider robots as a materialization of nightmares and fears where humans break the limits of religion and play God, creating "life,"

that is, robots with human appearance, as mentioned by Ramírez Plascencia (2020) in his document.

In the case of Latin America, the backwardness in technological development affects the popularity of service robots. AI and robotics have a long way to go before positively impacting non-tech markets. Culture, lack of trust in technology, and religion can be a thorn in service robots and customer relationships (Ramírez Plascencia, 2020). Unlike countries with developed economies, Latin American countries seem to be threatened with mass unemployment in the face of robotization and automation. According to a report by the Economic Commission for Latin America and the Caribbean (ECLAC), services are a predominant sector in the economies of Latin America and the Caribbean, representing 70% of GDP and 62% of total employment in 2015 (CEPAL, 2022; Schuster, 2018). As in other sectors of the economy, part of the future dynamism of services will depend on their automation; however, the Latin American employment culture is structured around informality. According to a report presented by ECLAC, the International Labor Organization (ILO) indicates that in 2016, 53.1% of workers in the region, equivalent to 130 million people, were in informal employment for their account and itinerant trade (Arciniegas, 2020). Poor labor policies prevent technological innovation from playing its role in productivity as it did in countries like Japan, the United States, and Germany. Distrust in technology derives from the possibility of generating high unemployment in the industry due to the lack of infrastructure for technological innovation and the absence of labor and economic guarantees by Latin American governments.

For its part, religion plays a vital role in preventing the adoption of robots since believers classify artificial intelligence as a false creator of "life" beyond the limits of faith and God by incorporating robots with human appearance and display of natural qualities of human beings (Ramírez Plascencia, 2020). Researchers such as Chiang et al. (2022) and Kose and Sakata (2019) believe that in the future humanoid robots will penetrate society so much that they can imitate humans' emotional processes, such as establishing intimate relationships or even feeling love. However, this prediction may not be reflected simultaneously throughout the world. Thus, cultural differences in customer satisfaction with the services provided in different markets should be considered in searching for the development of emotional intelligence in robots.

To smoothly implement robots in the service industry in countries with little technological development, this study suggests the development and implementation of policies to identify the levels of affectation that automation has in each industry and thus determine the possibility of technological investment in each. Automation implies a significant economic effort for many industries, so it is necessary to highlight the tax benefits and payroll savings of replacing a human employee with a robot (Naum Avila, 2021). Labor markets, for their part, should provide the tools to face exponential changes, and countries are required to support the transition of workers by offering social benefits. According to the Inter-American Development Bank (IDB), one aspect Latin America should evaluate for accelerating its automation process is the positive experience of technology adoption of developed countries prepared them for change and the benefits observed after the adoption of technology-driven by COVID-19 (Ripani et al., 2020).

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