Robots Saying "Hello, How Are You?": Humanoid Interaction in Customer Service[1]

Merhaba Nasılsınız Diyen Robotlar: Müşteri Hizmetlerinde İnsansı Etkileşim

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Abstract: This qualitative study investigates customers' perceptions and expectations of service robots through interviews with 45 participants. This study examines multifaceted dimensions of service robot interaction, including technology adoption, anthropomorphism and robot design, attitudes toward service failures, and the role of word-of-mouth (WOM) and satisfaction. The findings reveal that while participants are generally positive about technology and recognize the potential benefits of service robots, they also express concerns about unemployment and safety. Preferences for robot design vary, with participants favoring both humanoid and machine-like appearances. In the event of service errors, compensation expectations often include apologies and corrections. The study also highlights the critical role of customer satisfaction and the effectiveness of word-of-mouth marketing for dissemination. Drawing upon these findings, the study provides strategic implications for both practitioners and scholars on the successful development and integration of service robots.

Keywords: Robot, Anthropomorphism, Design, Humanoid, Word of Mouth Marketing, Satisfaction, Service Failure

JEL Classification: M31, M39, L82, L89

Öz: Bu nitel çalışma, 45 katılımcıyla yapılan görüşmeler aracılığıyla tüketicilerin hizmet robotlarına ilişkin algılarını ve beklentilerini araştırmaktadır. Çalışma, teknoloji benimseme, insanlaştırma ve robot tasarımı, hizmet başarısızlıklarına yönelik tutumlar ve ağızdan ağıza pazarlama (WOM) ve memnuniyetin rolü de dahil olmak üzere hizmet robotu etkileşiminin çok yönlü boyutlarını incelemektedir. Bulgular, katılımcıların genel olarak teknolojiye olumlu baktıklarını ve hizmet robotlarının potansiyel faydalarını kabul ettiklerini, ancak aynı zamanda işsizlik ve güvenlik konusunda endişelerini de dile getirdiklerini ortaya koymaktadır. Robot tasarımına yönelik tercihler farklılık göstermekte olup, katılımcılar hem insansı hem de makine benzeri görünümleri tercih etmektedir. Hizmet hataları durumunda, tazminat beklentileri genellikle özür ve düzeltmeleri içermektedir. Çalışma ayrıca müşteri memnuniyetinin kritik rolünü ve ağızdan ağıza pazarlamanın yayılımdaki etkinliğini vurgulamaktadır. Bu bulgulardan yola çıkarak, çalışma, hizmet robotlarının başarılı bir şekilde geliştirilmesi ve entegrasyonu konusunda hem uygulayıcılar hem de akademisyenler için stratejik çıkarımlar sunmaktadır.

Anahtar Sözcükler: Robot, Antropomorfizm, Tasarım, İnsansılaşma, Ağızdan Ağıza Pazarlama, Memnuniyet, Hizmet Hatası

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1. Introduction

Advances and innovations in technologies such as informatics, the internet, artificial intelligence, cloud technologies, and the Internet of Things have profoundly impacted business processes and daily life across various enterprise activities. Robotic technologies emerge as a disruptive innovation, fundamentally reshaping the dynamics of the service industry. While historically confined to industrial processes, robots are increasingly being deployed in diverse sectors beyond industry. Consequently, human-robot interaction is becoming more prevalent. The primary driver for robots, serving in various forms, features, and sizes to fulfill diverse functions, is the development of artificial intelligence technologies. Given these advancements, it is clear that the integration of technology and society will continue to accelerate in the future. The service sector is a key area for robot deployment. Robots operating in various service industries are termed service robots. Services, which are inherently heterogeneous, can become more homogeneous when delivered through robots. Empirical evidence suggests that such standardization may lead to heightened customer satisfaction and foster positive attitudes towards the business or brand, thereby facilitating the positive transmission of service satisfaction to others through physical or online environments—in essence, positive word-of-mouth communication about the business or brand. Conversely, a customer dissatisfied with a service robot's performance will likely convey this negative experience. Service robots frequently take on humanoid forms. Research indicates that individuals react differently to the degree of robot humanization (Leite, Pereira, Mascarenhas, Martinho, Prada, & Paiva, 2013; Du, 2020). A review of the relevant literature reveals a significant gap in social science studies concerning the interaction between the degree of humanization in service robots, customer satisfaction, and word-of-mouth marketing (Başer & Bakırtaş, 2023). This gap formed the foundational framework for the study, specifically addressing how customers perceive interactions with service robots exhibiting varying degrees of humanization and humanoid features. The study's objective is to determine whether service robots with humanoid features and varying degrees of humanization influence customer satisfaction and word-of-mouth marketing. To achieve this, the study examines concepts such as technology adoption, service robots, anthropomorphism and the degree of humanization in robots, robot design, word-of-mouth marketing, and satisfaction. The absence of studies integrating these variables underscores the unique contribution of this research.

2. Conceptual Framework

2.1. Service Robots

Advances in robotic technologies have begun to transform various business processes across diverse sectors. As a rapidly expanding ecosystem, the robot ecosystem has emerged as a new business domain encompassing automation, artificial intelligence, machine learning, and human-robot interaction. The term "robot" was first coined by Čapek (1920), referring to the creation of human-like machines designed to work for humans. With developments in Internet and artificial intelligence technologies, robots have progressively integrated into daily life. According to the International Federation of Robotics (IFR, 2020), robots are defined as "*programmable, manipulative devices designed to perform a large number of tasks automatically*". Robots can also execute tasks such as information processing, data analysis, and environmental sensing, and can physically mimic humans (IFR, 2020; Lin, Abney, & Bekey, 2011).

The ongoing transition from Industry 1.0 to 5.0 highlights how internet and information technologies are reshaping business processes and societies. Concepts like Marketing 5.0, Society 5.0, Industry 5.0, and Web 5.0 underscore the growing importance of the internet, cloud technologies, artificial intelligence, the Internet of Things, mixed reality, and robot-human integration. Robots are increasingly adopted to boost productivity and reduce costs. Their ability to operate 24/7, organize complex tasks, and coordinate work flows has made them a preferred choice for businesses. With increased human-robot interaction, businesses have also begun to leverage robots for marketing activities (Özden, 2022).

The International Federation of Robotics (2020) categorizes robots into industrial robots and service robots. While industrial robots feature automated, multi-purpose arms, service robots are non-industrial vehicles that perform tasks beneficial to humans or other machines. Enabled by artificial intelligence and machine learning, service robots can also make non-physical decisions and are integrated into businesses' marketing strategies. The most significant differentiator for service robots is their capacity for human interaction within the same environment, which places them in the category of social robots and enhances their ability to communicate with people. Particularly in the accommodation and food and beverage sectors, staff shortages and service standardization issues are accelerating the adoption of service robots. These robots enhance operational efficiency by performing tasks such as guest greeting, product delivery, and cleaning.

The service robot market is projected to reach $3.083 billion by 2030, a statistic that underscores businesses' increasing reliance on this technology (Breazeal, 2003; Duffy, 2003;

Kosuge and Hirata, 2004; Goodrich and Schultz, 2008; Breazeal Gray, and Berlin, 2009; Kwak, 2014; Ferro, & Marchionni, 2014; Leminen, Westerlund, & Rajahonka, 2017; Kahraman, Deveci, Boltürk, & Türk, 2020; Choi, Choi, Oh, & Kim, 2020; Tuomi, Tussyadiah, & Stienmetz, 2020; Fox & Gambino, 2021; Allied Market Research, 2021). Given the increasing human interaction facilitated by service robots, "service robot" constitutes the first theme of this study.

2.2. Technology Adoption

The Technology Acceptance Model (TAM) and Diffusion of Innovations Theory (DOI) are prominent frameworks in the adoption of new technologies. While TAM focuses on individual user acceptance, it links the intention to use technology to perceived usefulness and ease of use.

Perceived usefulness refers to the expectation of increased performance, whereas ease of use represents the minimum effort required. DOI, on the other hand, examines how innovations disseminate through a social system over time. This theory identifies five key characteristics—relative advantage, compatibility, complexity, trialability, and observability—and five groups of adopters: innovators, early adopters, early majority, late majority, and laggards. Societal values, trust, risks, and individuals' openness to innovation also influence the adoption process. Together, these two theories offer a comprehensive understanding of technology adoption and form the basis of extensive research (Davis, 1989; Venkatesh & Davis, 2000; Rogers, Singhal, & Quinlan, 2014). This study, which focuses on service robots, is grounded in both the Technology Acceptance Model and Diffusion of Innovations Theory. Therefore, "technology adoption" was established as the second central theme of the study, based on the relevant literature.

2.3. Anthropomorphism, Uncanny Valley Theory and Degree of Humanization

The literature extensively discusses the extent to which service robots should possess human characteristics through the concept of anthropomorphism. This term, derived from the Greek words "anthropos" (human) and "morphe" (form/structure), refers to the attribution of human characteristics to non-human entities (Kassarjian, 1978; Guthrie, 1997; Duffy, 2004; Daston & Mitman, 2005). Anthropomorphization can manifest in various forms, ranging from weaker expressions, such as individuals identifying similarities with an anthropomorphized object (Guthrie, 1997), to stronger forms where people adopt and confirm a personal belief that the non-human agent possesses human-like characteristics or qualities (Epley, Waytz, &

Cacioppo, 2007; Kiesler, Powers, Fussell, & Torrey, 2008; Root-Bernstein, Douglas, Smith, & Verissimo, 2013).

DiSalvo, Gemperle, and Forlizzi (2005) categorize anthropomorphism into four distinct forms: structural, gesture-based, character-based, and awareness-based. The significance of these forms lies in their application to service robot design. Structural anthropomorphic design involves crafting objects to resemble or function like the human body (e.g., robots resembling a human arm), which facilitates human-technology interaction and aids in understanding human movement. Gesture-based anthropomorphic design replicates human body language and gestures in object design, using facial expressions or body movements in interfaces to enable natural human-technology interaction. Character-based anthropomorphic design reflects human character traits, endowing objects with a distinct identity and social quality. This aims to foster emotional connections between people and objects, leading to more pleasant interactions (e.g., humorous robots or empathetic virtual assistants). Finally, awareness-based anthropomorphic design seeks to imbue objects or systems with human thinking and questioning abilities. Through robotics and artificial intelligence algorithms, this form mimics human brain functions such as learning, memory, and problem-solving (e.g., autonomous vehicles).

Anthropomorphism, or the humanization of objects, is a powerful marketing tool. Customers tend to attribute human characteristics to humanized products or service robots, increasing their desire for an emotional connection, especially when robots resemble humans (Murphy, Gretzel, & Pesonen, 2021; Abdi, Tojib, Seong, Pamarthi, & Millington-Palmer, 2022). With the growing use of robots in business, the degree of robot humanization and human-robot integration have become crucial in shaping people's perceptions of robots. Anthropomorphic products can enhance customer commitment and loyalty by fostering an emotional bond. Customers exhibit more positive attitudes towards human-like products, which positively impacts perceived usefulness. As the humanoid characteristics of robots increase, so does customer trust, leading to stronger social relationships. This, in turn, positively affects customer satisfaction and willingness to spend (Cusick, 2009; Chandler & Schwarz 2010; Hart, Gratch, & Marsella 2013; Landwehr, McGill, & Herrmann, 2011; Leite et al., 2013; van Doorn, Mende, Noble, Hulland, Ostrom, Grewal, & Petersen, 2017; Belanche, Casaló, Flavián, & Schepers, 2020; Yoganathan, Osburg, Kunz, & Toporowski, 2021; Başer & Bakırtaş, 2023). However, some literature suggests that while object humanization elicits positive emotions up to a certain point, crossing a 'critical threshold' can trigger negative effects, such as disgust, aversion, and fear of robots (Du, 2020). The degree

of humanization refers to the extent to which a robot's physical and psychological characteristics resemble those of humans. Studies on the optimal degree of humanization for human-service robot interaction are often explained by the Uncanny Valley Theory. Proposed by Japanese roboticist Mori, this theory posits that as robots increasingly resemble humans, an initial rise in positive emotions can suddenly plummet into uneasiness, disgust, and fear once a certain level of similarity is reached. Only when near-perfect resemblance is achieved do positive emotions return (Mori, 1970; Geller, 2008; Mori, MacDorman & Kageki, 2012; Saç, 2024; Doğan Erdinç & Soydaş, 2024).

Research on the Uncanny Valley Theory indicates that as the degree of robot humanization increases, people tend to become anxious and perceive robots as a threat. Furthermore, humanoid service robots can elicit negative customer reactions by creating eeriness and posing a perceived threat to human identity. Some studies have found that respondents are more satisfied with services provided by product-oriented robots than by human-oriented robots. While customers emphasize the importance of functional features and utilitarian values in robots, overly human-like service robots are not always fully accepted. Technologically inexperienced individuals, in particular, may hesitate to use service robots. Some participants have even suggested that service robots would generate more positive attitudes if they were objectified rather than humanized. A study on robot baristas, for example, highlighted that while ease of use, reasonable price, and reliability motivated robot acceptance, negative attitudes emerged when their behavior and appearance were too human-like (Kwak, 2014; Nakanishi, Kuramoto, Baba, Kohei, Yoshikawa, & Ishiguro, 2018; Mende, Scott, Van Doorn, Grewal, & Shanks, 2019; Du, 2020; Ghazali, Mutum, Pua, & Ramayah, 2020; Fernandes & Oliveira, 2021; Wan & Chen, 2024; Leong & Zhang, 2024). Regarding service robots, humanoid robots are viewed more positively as employees' technological knowledge increases and more negatively as it decreases. Individuals can perceive human similarity differently even when observing the same robot. In the hospitality sector, non-human-like robots are generally more acceptable. While service sector employees may perceive robots as a threat to employment and experience stress, customers with high technology self-efficacy often prefer humanoid robots (Fan, Wu, Miao, & Mattila, 2019; Simon, Neuhofer, & Egger, 2020; Vatan & Doğan, 2021; Başer & Bakırtaş, 2023; Shum, Kim, Calhoun, & Putra, 2024).

2.4. Robot Design

Achieving congruence between appearance and capability is paramount in robot design. Overly humanoid robots can create unfulfilled expectations; for instance, a robot with a

human face is expected to be able to speak and listen. Designers must therefore carefully consider the level of anthropomorphism to prevent disappointment. Robot design is crucial for both employees and customers. Perceived human resemblance and functionality influence customers' purchase intentions. While early technology adopters may favor more humanoid designs, mainstream customers often prefer simpler, more controllable designs. Product gender also serves as a significant marketing factor. Attributing masculine (e.g., sharp lines, dark colors) or feminine (e.g., rounded lines, light colors) characteristics to products can influence customers' propensity to purchase and brand preferences. These gender stereotypes are powerful tools for shaping customer behavior, impacting purchase decisions and satisfaction. Consequently, the assigned gender of designed robots becomes an important consideration (Aaker, 1997; Fiske, Cuddy, Glick, & Xu, 2002; Bartneck, Kulić, Croft, & Zoghbi, 2009; Grohmann, 2009; Van Tilburg, Lieven, Herrmann, & Townsend, 2015; Lieven, Grohmann, Herrmann, Landwehr, & van Tilburg, 2015; Hess and Melnyk, 2016; Risman, 2018; Machado, Vacas-de-Carvalho, Azar, André and dos Santos, 2019; Lim, Cheah, Ng, Kamal Basha and Liu, 2021; Zhang and Wang, 2023; Randall and Šabanović, 2024; Qin, Xie, Ding, Wang and Xu, 2024; Randall and Šabanović, 2025).

A review of the literature on robot design and humanization degrees highlights the implications of the Uncanny Valley Theory's propositions. A robot's appearance and capabilities play a critical role in customer perception. Cultural adaptation and the development of a service culture are also vital aspects of robot design (Murphy, Gretzel, & Hofacker, 2017).

Duff (2003) emphasizes the necessity of humanoid features for social interaction, while Foner (1997) cautions that high expectations from overly humanoid robots can lead to disappointment, thus stressing the importance of balance in design. Anthropomorphism facilitates human-robot interaction by enhancing both physical and social functionality. In the retail sector, companies should align robot design with user expectations, considering both customer and business needs (Barnett, Foos, Gruber, Keeling, Keeling, & Nasr, 2014). Sun, Ding, Wang, and Meng (2024) found that humanoid design increases positive emotional responses and purchase intent. For instance, incorporating a cute appearance, a warm tone of voice, and friendly words can enhance the design of human-interacting robots. Aesthetic and emotional design bolsters product competitiveness (Gan, Ji, Jiang, Liu, Feng, Li, & Liu, 2021).

Lee et al.'s (2025) study demonstrates that a robot's outer shape, head, and color influence aesthetic perception, while emotional features such as 'intelligence' impact customer

preference. When robot movements and expressions are designed with human involvement, human-robot interaction improves. Effective human-robot interaction is essential for the successful adoption of service robots (Hoffman & Ju, 2014; Bleeker & Rozendaal, 2021; Lee et al., 2025). Collins (2020) provided guidelines for robot design. Kharub, Lwin, Khan, and Mubin (2021) emphasize the importance of service quality factors like reliability, empathy, and entertainment in robot design, proposing the SERVBOT model. Both studies highlight that a robot's movements significantly impact customer perception. Businesses and manufacturers must understand why people adopt or reject robots to design more interactive ones (Başer & Bakırtaş, 2023). Sophisticated robot designs are perceived to correlate with higher social skills. When designing robots for human interaction, varying levels of intelligence should be incorporated based on specific service goals to positively contribute to customer brand loyalty (Hegel, 2012; Wünderlich, Blut, & Brock, 2024; Le, Sajtos, Kunz, & Fernandez, 2024). Çetin (2024) asserts that robots should be designed with cultural characteristics in mind, while Song, Li, Leung, and Mei (2024) state that perceived warmth enhances satisfaction. As customers' technological knowledge increases, so does their preference for highly anthropomorphic robots (Choi et al., 2019; Stroessner & Benitez, 2019; Rahimian, Zabihi, Atashzar, Asif, & Mohammadi, 2020). Mobed, Wodehouse, and Maier (2024) identified the 'wow effect' and ease of use as primary factors influencing the adoption of service robots. Yijin, Shiman, and Xiaoyan (2020) and Yi and Wang (2022) indicate that social status and educational differences affect attitudes toward robot use. Robot design should consider not only the primary user but also the broader environment and social interactions (Severinson-Eklundh, Green, Hüttenrauch, 2003). Based on the literature discussed, "anthropomorphism and design" serves as the third central theme of this study.

2.5. Service Failure, Word of Mouth Marketing and Satisfaction

Service failures represent a significant issue that negatively impacts customer satisfaction and loyalty (Uyar & Akar, 2024). Customers often possess a certain tolerance for the services offered to them and may, at times, overlook errors encountered within this framework (Parasuraman, Berry, & Zeithaml, 1991). Such errors, defined as deviations from customer expectations, are as inevitable in services provided by service robots as they are in traditional services (Newton, Wong, & Casidy, 2018; Chang et al., 2024). With the growing adoption of robots in the hospitality industry, meticulous attention must be paid to robot design and management.

Robots that appear warm and competent can facilitate service error compensation. Furthermore, robot behavior consistent with customer relationship norms and continuous

improvement are crucial. The influence of robots on customer satisfaction is linked to human interaction, robot behavior, and cultural differences. Designing robots in alignment with customer needs enhances satisfaction, whereas a mismatch can lead to dissatisfaction. Factors such as ease of use, perceived usefulness, and perceived warmth also contribute to satisfaction. While 'cute' robots may increase error tolerance, service failures can still cause significant concern. Customer-centered design, consideration of cultural differences, and ease of use are pivotal for the success of service robots, customer satisfaction, and positive word-of-mouth marketing (Brady & Cronin, 2001, Dennett, 2003; Teng, 2011; Waytz, Heafner, & Epley, 2014; Gan et al, 2021; Pijls, Groen, & Termaat, 2021; Choi, Oh, Choi, Kim, 2021; Fernandes & Oliveira, 2021; Lv, Liu, Luo, Liu, & Li, 2021; Liu, Yi, & Wan, 2022; Grazzini, Viglia, and Nunan, 2023; Lee et al., 2025; Shum, Kim, Calhoun, and Putra, 2024; Osakwe, Říha, Elgammal, and Ramayah, 2024; Chang, Zhang, Li, and Li, 2024). As highlighted in the literature, service failures directly impact satisfaction and word-of-mouth marketing. To mitigate service errors, robots should be designed to align with environmental conditions, target audience, the specific sector of use, and cultural norms. Consequently, "service failure" constitutes the fourth theme of this study, and "word-of-mouth marketing and satisfaction" forms the fifth theme.

3. Methodology

3.1. Methodology of the Study

Building on the concepts outlined above, this study aims to determine the impact of service robots' humanization and humanization degree on customer technology adoption, the role of service errors in word-of-mouth marketing, and their effect on satisfaction. To achieve this, a qualitative approach was employed, utilizing a phenomenological research design. Data were collected through semi-structured interviews. The interview questions were developed following a comprehensive review of the relevant literature, refined through expert opinion, and further revised after a pilot study. Participants provided informed consent for the interviews, which were recorded. To enhance the study's credibility, findings were compared with those of similar studies, and participants' direct quotes were included. To ensure validity, questions with similar content were posed, and participant statements were cross-referenced with recorded responses (Myers, 2019; Creswell, 2013; Smith, 2015; Willis, 2015).

The study's target population comprised customers who purchase services and actively follow technological developments. The sample was determined using the snowball sampling method, a type of purposive sampling. This method, suitable for exploring and explaining phenomena, facilitated the identification of participants capable of providing relevant data. In

qualitative research, data saturation is key to determining sample size (Mason, 2010); thus, the researcher can determine the number of samples based on the data obtained. In this study, 45 participants were recruited. The interview data were subjected to descriptive analysis. The purpose of employing descriptive analysis was to pre-establish study-related themes based on the research question and literature review. These themes—technology adoption, service robot, anthropomorphism and design, service failure, and word-of-mouth marketing and satisfaction—were outlined in the conceptual framework section. Descriptive analysis involves several stages: initially, data are classified according to the relevant themes, followed by summarization and reporting of the prepared and organized data. Due to the small sample size, manual analysis was applied, allowing for close observation and comprehensive review of participants' responses (Kitzinger, 1995; Kvale, 1994; Creswell, 2013; Nowell, Norris, White, & Moules, 2017). Before commencing the interviews, participants were shown four robots and presented with a scenario depicting these robots working in a service sector.

The robots used were sourced from the ABOT (Anthropomorphic roBOT) database (https://www.abotdatabase.info/collection, 2025). This database was chosen for its wide variety of robot types, ranging from highly mechanical to very humanoid. Specifically, two male and two female robots were selected: two with the highest humanoid scores (Jia Jia, Milo) and two with low humanoid characteristics (Anette, Aido) (https://www.abotdatabase.info/collection, 2025). The rationale for selecting these four robots was to ascertain participants' views on the humanoid characteristics of service robots and to examine whether robot gender influences customer interaction."

4. Findings

Of the 45 participants in the study, 29 were female and 16 were male. Regarding age, 25 participants were between 18-25 years old, 6 were between 26-35, 9 were between 36-45, and 5 were 46 years or older. In terms of occupation, 25 participants were students, 11 were public employees, 3 worked in the private sector, 2 were self-employed, and 3 were retired. As outlined in the conceptual framework, the study's questions were grouped under five core themes derived from the relevant literature: technology adoption, use of service robots, anthropomorphism and robot design, service failure, and word-of-mouth marketing and satisfaction. The findings pertaining to these themes are presented below.

4.1. Findings Related to the Service Robot Theme

This section explores participants' perspectives on the use of service robots, aligned with the study's first theme. Participants were initially asked if they had heard of the term "*service*

robot" and, if so, where. While their awareness of service robots varied, most had encountered the concept visually through the internet, social media, or videos, but had not physically interacted with them. Participants primarily associated service robots with sectors like Asian countries' service industries and restaurants/cafes.

The study also probed participants' thoughts on receiving service from robots, revealing diverse opinions categorized into five sub-themes: technological advancement, concern, practicality and efficiency, benefit and convenience, and indecision. Some participants viewed service robots as a sign of technological advancement, supported by statements like "*a flow that works through algorithms*". Conversely, some found service robots "*worrying*" due to concerns about unemployment. For example, a participant stated: "*I find it a little scary because I think it will replace people*," and "*our jobs are done more quickly, but the fact that it replaces people and increases the number of unemployed people upsets us job seekers*". Practicality and efficiency were highlighted by other participants, who believed service robots could save time and accelerate services. P40 remarked, "*I think we save time because they can serve faster and respond faster*," underscoring this advantage. Benefit and convenience emphasized service robots' potential to simplify life, particularly for individuals with disabilities. P42 noted, "*I think it will be more beneficial for disabled individuals. I think it will make their lives easier*," demonstrating sensitivity on this matter. Finally, some participants expressed indecision, acknowledging both the advantages and disadvantages of service robots.

4.2. Findings Related to Technology Adoption Theme

This section addresses participants' technology adoption status, framed within the Technology Acceptance Model and Diffusion of Innovations Theory. To gauge participants' technology adoption, the initial question posed was, "How would you describe your relationship with technology?" The majority reported a positive relationship, actively integrating technology into their daily lives and exhibiting a high interest in following technological advancements. Statements such as "*I closely follow the latest technologies and technological products*" and "*I am interested in technological tools and follow the developments*" exemplify this engagement.

Most participants underscored the practical benefits of technology and its capacity to simplify life, indicating a multifaceted relationship with technology. Another question under this theme was, "How useful would you find the service that the service robot will provide you? Which features do you think will benefit you?" Analysis of responses revealed diverse opinions on the usefulness of service robots, summarized in several sub-themes. Accordingly, the sub-themes were listed as follows:

Usefulness: Many participants believed service robots could offer benefits such as time savings, faster service, and practicality. P20 elaborated: "*The usefulness of the service that the service robot would provide would depend on its speed and accuracy. If it brings the orders completely, shortens the waiting time and provides advantages in terms of hygiene, I would find it very useful. What would be most important to me would be functionality, accuracy and user-friendliness. Since I am good with technology, I can probably use it easily, but it is still important that it has a practical interface and a clear system of use*". Ease of Use: Some participants indicated they would use service robots based on their ease of use. P31 stated, "*I find it useful. I think I can reach it quickly because I think the risk of error will be low. I can learn to use it*". P28 added, "*I think that artificial intelligence can be easily communicated with. It can speak in every language, especially in tourism regions. It will be durable to stand for a long time. It can accurately convey the contents of the products, it has information about the pictures and preparation times, while people's perception is scattered during the long working hours of the day, for example, in a restaurant providing food services, it can count all the products, memorize their prices and not forget them, its perception is clear. I think I can get an unbiased and unprejudiced service*". Technical Concerns and Reliability: Conversely, some participants expressed concerns about technical issues and reliability. P17 remarked, "*I have doubts that it will provide service*". P4 noted, "*There may be technical errors. That's why I don't think it will be very useful*". P27 expressed, "*I think the current technology is not at a sufficient level, I think it is not in a position to meet the expectations of customers adequately*". Expectations and Needs: Participants indicated that the usefulness of service robots would depend on their alignment with personal expectations and needs, emphasizing fast and accurate service, functionality, and error-free operation. The likelihood of use increases as the robot meets these criteria. Participants were also asked if they perceived any risks when using a service robot. Responses revealed various perceived risks, primarily centered around technological failures, security, and privacy concerns. Many anticipated technical malfunctions leading to service disruptions. P20 commented: "*I think there may be some risks when using the service robot. For example, there may be a technical failure, an error in orders, or a risk of collision when moving in tight spaces. Also, in terms of data security and privacy, if it collects customer information, extra precautions need to be taken. However, a well-programmed and regularly maintained robot can minimize these risks. After all, technology has its advantages as well as points to be considered*". Communication and Understanding Problems: Some participants feared difficulties in expressing themselves to robots and that their requests might not be fully understood. Loss of

Control and Unknown Dangers: More abstract risks included the potential for robot control falling into malicious hands or unexpected AI development. P28 stated, "*If it records the face and voice of the people it serves in the future, or if it is produced with features that record card information while receiving payment, there will be a risk*". Trust in Technology: A subset of participants expressed trust in technology's evolution, believing risks would be minimized over time. P34 noted, "*There is always risk. I do not think it is more risky than the smart devices we use in daily life. In this respect, I do not consider it very different from the risks that are currently in our lives*". This indicates diverse risk perceptions among participants. When asked, "How do you predict that service robots will change the service sector?", participants anticipated significant changes, expressing both positive and negative opinions. Labor and Employment Impact: Most foresaw a negative impact on labor and employment. P2 remarked, "*I think it will significantly reduce the manpower and may cause financial problems*". P7 added, "*It takes away the jobs that people will do and I think this will cause an economic crisis*". New Employment and Efficiency: Conversely, some believed service robots would create new employment opportunities, enhance service quality, and reduce costs, leading to increased efficiency and speed. P11 stated: "*Considering that these robots in the service sector will develop in the future, I think it will positively affect the service sector, already digitalization is increasing, people's use of digital and AI is increasing, which will facilitate communication with these robots. I think that the use of such robots will increase*". P28 shared, "*I see it positively because it will reduce the physical labor expenditure of human beings. I think it will increase the quality of service, reduce the time to receive service, and bring satisfaction to the sector*". P34 elaborated: "*Service robots will primarily change the employment structure. Human working together with robots will require re-evaluation of working life in terms of different disciplines. Robots that complement or substitute manpower provide cost and efficiency advantages. They can be quite successful, especially in repetitive, relatively simple tasks. The data storage, learning and analysis capacity of robots can provide better quality services. Their complementary role to humans in standardizing service quality, personalized service, etc. can make robots indispensable in the service sector*".

Human-Robot Collaboration: Some participants emphasized the importance of service robots working in harmony with human employees, stressing that the human factor should not be entirely eliminated. P20 noted: "*I think service robots will change the service sector significantly. They can reduce human errors by increasing speed and efficiency, especially in places like restaurants, hotels and cafes. One of the biggest impacts of this change could be*

faster service during peak hours. However, I think that robots cannot fully replace the human touch in situations that require one-to-one communication with the customer. My expectation is that robots will facilitate the process by working in harmony with human employees, but not completely eliminate the human factor". Finally, participants were asked, "When would you decide to use a service robot? Who or what would be effective in making this decision?" Most participants indicated usage indecision; they had not yet decided or used a service robot. Some attributed this to insufficient information or uncertainty about the technology's suitability. When the answers given to this question were analyzed, the following sub-themes emerged. Price and Accessibility Concerns: Affordability and accessibility were significant factors, with many perceiving service robots as expensive or not yet widely available. Need and Utility Orientation: Participants considered using service robots only when necessary and demonstrably beneficial. Expectation of Widespread Adoption: Some participants anticipated using robots only after they became more widespread due to technological development, with one stating, "*I think it will become widespread in the next 5 years,*" reflecting this expectation.

4.3. Findings Related to the Theme of Anthropomorphism and Robot Design

Third main theme of the study explored participants' preferences for anthropomorphism and robot design. The first question asked was, "How 'realistic' or 'natural' should the design (appearance, movements) of the service robot seem to you? What does it mean to you if the robot looks 'fake' or 'machine-like'?" Participants expressed diverse expectations regarding service robot design. When the answers given to these questions were analyzed, the following sub-themes emerged:

Humanoid Preference: Some of the participants desired human-like facial expressions, movements, and overall appearance, believing it would foster sincerity and facilitate interaction. Statements like "*It should be realistic so that it should give that feeling of sincerity from a human*" and P3's statement; "*The more it looks like a human, the more it can give the feeling of interacting with a human*" exemplify this. Machine-Like Preference: Conversely, other participants preferred robots to appear more machine-like, finding a humanoid appearance potentially disturbing, frightening, or scary. P40's statement "*The robot should be like a robot, realistic ones will cause big problems*" reflects this viewpoint. A machine-like, low-humanization design was seen as reassuring, reminding them that the robot is merely a tool. Functionality vs. Aesthetics: While some participants prioritized functionality over appearance, others stressed the importance of aesthetic design. Discomfort and Fear: When robots too closely resembled humans, participants reported feelings of discomfort and fear. For example, P24 stated, "*Everything fake is scary,*" and P29 noted, "*If it*

looks too much like a human, I may be afraid, I may want to relate to it on a human level, which may upset me". Insincerity: Participants also perceived a lack of sincerity in robot communication. P13 remarked, "*Whether it is a gesture or a speech, it would be fake in terms of communication and would not be sincere*," and P17 stated, "*The fact that it is a machine means that it is artificial and cannot pass the communication to the other party*". These comments highlight concerns that robots cannot achieve genuine human sincerity. The study also asked, "How important is it for you that the service robot has 'human-like' social skills? How does the robot acting 'consciously' or 'unconsciously' affect your service experience?" Participants held varied expectations regarding social abilities and conscious behavior in service robots: When the answers given to this question were analyzed, the following sub-themes emerged: Humanoid Abilities and Conscious Movements: Most participants believed that human-like abilities and conscious movements would enhance the service experience. The sentiment "*It is important that they have human-like social abilities, the more they have these abilities, I think it will be more fun and easier to communicate*" reflects this preference. However, excessive humanization could lead to discomfort or fear, as P20 articulated "*If the service robot has human-like social skills, it can make the service experience more natural and enjoyable. Making simple gestures, appearing to make eye contact or communicating with a gentle tone of voice can make it feel more friendly. However, robots that try to be too human-like and do not fully succeed can sometimes evoke a strange feeling*". Conscious vs. Unconscious Behavior: Participants significantly differentiated between conscious and unconscious robot behavior. Logical, fluid, and environmentally responsive movements were seen as contributing to a comfortable and safe service process. Conversely, random, dull, or unexpected behavior could irritate users and undermine reliability. Conscious robot behavior was largely perceived to positively impact the service experience, while unconscious behavior evoked fear, insecurity, discomfort, and concern, as expressed by (P32 and P29); "*It would scare me if robots act unconsciously*" and "*It would create dissatisfaction for me if robots act unconsciously*". Controlled and Limited Abilities: Some participants preferred robots with controlled and limited abilities. Contextual Variation: The importance of a robot's human-like features varied based on the service environment. Participants noted that a robot in an entertainment setting should have a different tone of voice than one delivering news in a hospital. Another question posed was, "How important is it for you that the service robot has an 'artificial' or 'realistic' personality? How does the robot's 'emotional' or 'logical' reactions affect your perception of its reliability?" Participants presented diverse expectations for robot personality and reactions. When the answers given to this question were analyzed, the

following sub-themes emerged: Realistic and Logical Personality: Some participants preferred robots to be realistic and logical, believing this would enhance their reliability. Emotional Reactions: Others felt emotional reactions were also important. Control and Security: Some participants preferred controlled robots with limited abilities. Situational Variability: Participants indicated that robot reactions should vary according to the service context. For instance, "*the fact that the service robot has an artificial personality and gives logical reactions makes me perceive its reliability positively*" (P21) exemplifies this. When asked, "How important is it for you whether the service robot's movements are 'stiff' or 'graceful'? How does the robot's mobility affect your service experience?", the vast majority emphasized the importance of graceful movements. Graceful Movements: Graceful movements were believed to instill trust, improve service quality, and ensure customer satisfaction, enhancing the robot's reliability and professionalism. Impact on Service Experience: Robot mobility directly influenced the service experience, with fast, consistent, and balanced movements building trust and satisfaction. Stiff movements, however, were reported to cause discomfort and uneasiness, reducing trust and appearing unprofessional. The question, "How much do you think the service robot should resemble a human? Which features of the robot should be 'human-like' and which features should be 'machine-like'?" elicited varied opinions on robot human-likeness. The sub-themes related to the answers to these questions are listed below. Spectrum of Human-Likeness: Some participants desired fully human-like robots, while others preferred a machine-like appearance. A balance between humanoid and machine-like features was also favored by some. Functionality Over Appearance: Some participants prioritized a robot's functionality over its human-like appearance. Limited Humanoid Features: Others preferred robots with limited humanoid features, such as "*Appearance, cute, maybe eyes or arms, humanoid voice, tone of voice, I think it is enough*". Fully Machine-Like: A segment of participants preferred robots to be entirely machine-like. Context-Specific Design: Many participants advocated for robots designed according to their specific service area. Statements like "*I think it should be designed in line with the service it provides*" and "*The service robot should have humanoid features enough to have the features that can best perform the service it will provide*" summarized this view. Findings indicated a preference for robots to be machine-like for functionality and speed, but human-like for communication and emotional characteristics. Participants were also asked, "When interacting with the service robot, which features of the robot (design, social skills, level of consciousness, mobility, etc.) do you think are the most important for you? Why?" The sub-themes related to the answers to these questions are listed below. Prioritized Features: The most participants emphasized

features included mobility, level of consciousness, design, and social skills. Mobility: Many considered robot mobility paramount, directly impacting functionality and service quality. Level of Consciousness: This was deemed important for correct and logical decision-making, increasing perceived reliability. Design: Design was also a crucial factor, influencing the robot's attractiveness and user experience. Comments such as "*If it is a simple and easy on the eyes, it can be good*," "*I think design is the most important visual perception, then the level of movement, then the level of consciousness*" and "*If we list the most important features for me, design in terms of communication, mobility in terms of establishing proximity and safe mutual movement, and the level of consciousness for the last level of communication*" highlighted its significance. Social Skills: Participants also valued social abilities and communication skills, believing they made interactions more enjoyable and humanized. Skills and Functionality: The robot's overall skills and functionality were also important criteria. When asked, "How important is the design of the service robot (appearance, shape, details, being attractive / cute) for you?", participants generally agreed on the importance of design for the perceived service experience, though specific preferences varied. When the answers given to this question were analyzed, the following sub-themes emerged. Attractiveness and Cuteness: The majority of the participants desired attractive and cute robots. Durability and Longevity: Some of them prioritized durability and longevity. Undecided or Practicality-Focused: Some participants remained undecided, while others stressed practicality and usability, suggesting design should be customized for different sectors. "*Design is the most important factor that establishes a connection between the product and the user. Designing the product by taking user needs into consideration increases the interaction of the product with the user. For me, design is very important, I prefer service robots whose appearance is more cute, more humanoid and more robust*" demonstrates the perceived importance of design, which also affects the robot's attractiveness, usability, and reliability. The final question for this theme was, "How important are the social skills of the service robot (friendly, responsible, intelligent, etc.) for you? How do you think these abilities affect your perception of the robot's reliability and competence? In which situations might it be risky to trust robots?" Participants had varied expectations regarding social capabilities. When the answers given to this question were analyzed, the following sub-themes emerged: Importance of Social Skills: Most of the participants deemed social skills important, believing friendly, responsible, and intelligent robots would enhance interaction. Functionality Preference: Others emphasized functionality, stating, "*I do not expect social skills. I expect it to work*", suggesting that social skills might overshadow the primary service purpose. Reliability and Data Privacy Concerns: Concerns

about robot reliability and personal data privacy were prominent. For example, "*it would be risky if it starts to interfere with personal life. it would be dangerous when it starts to process personal information and respond accordingly*" exemplified doubts about data processing and security. Over-learning by AI and access to personal data were also identified as risky. Participants were further asked, "How important is it for you that the service robot shows emotional reactions (e.g., sadness, joy)? How does the emotional intelligence of the robot affect your service experience?" Varied Views on Emotional Reactions: Opinions on emotional reactions differed. Some valued emotional intelligence for a more human-like and enjoyable interaction, believing it would enable empathy and better understanding of user needs. Functionality Over Emotion: Others prioritized functionality, asserting that a robot's main purpose is service provision, and emotional reactions could detract from this. Artificiality and Skepticism: Some worried that robot emotions would be artificial or fake. "*I would not be affected because I know it is fake... the embarrassment of the robot is not possible*" expressed this skepticism. Controlled Emotions: Participants generally preferred simple and controlled emotional reactions, with "*Its emotional intelligence should be at a minimum level, this will positively affect my experience*" as an example. Excessive emotional reactions were thought to reduce reliability and functionality. Positive vs. Negative Emotions: Positive emotional reactions (joy, smiling) were more acceptable than negative ones (sadness, anger), which caused discomfort. A few expected human-like emotional reactions for better human communication, while two participants viewed emotional robots as a risk factor, causing uneasiness. To explore further, the question "Do you feel uncomfortable with the idea of robots having emotions?" was posed. According to the answers, sub-themes can be seen below: Discomfort with Emotions: The majority of the participants expressed discomfort, fearing robots could replace humans, become uncontrollable, and pose security risks. Machines vs. Emotions: Those participants comfortable with the idea viewed robots as machines whose emotions would be artificial. Ambivalence: Some participants were ambivalent or hesitant, unsure of the consequences of robot emotions. Uncontrollability and Security: Participants who were uncomfortable emphasized concerns about uncontrollable emotions and security risks. "*If we think outside the field of service, yes, it creates the perception of the risk that robots can completely replace humans*" and "*I think it can be good up to a certain point, but after a certain point, when emotions are involved, for example, arrogance, ego, etc. these can lead to much more serious problems*" reflected these concerns. Human Replacement: Some of the participants worried that robot emotions might increase the risk of human replacement, leading to existential questions like "*On the one hand, this makes*

me wonder what will happen in the future, will we become their slaves". Discomfort in Service Sector: Some felt that humanoid robots would cause discomfort in the service sector. The study also asked, "Which type of robots (humanoid-non-humanoid) would you feel more comfortable talking to? Why?" Diverse Preferences: Preferences for humanoid versus non-humanoid robots varied. Some participants found humanoid robots more comfortable and engaging due to their human-like reactions and communication facilitation. Safety and Intimacy with Non-Humanoids: Others found non-humanoid robots safer and more intimate, expecting clearer, non-deceptive communication. Fear and Discomfort: Some found humanoid robots frightening or disturbing, with one stating, "*Non-humanoid, the other kind scares me*". Trust and Interest in Technology: The sub-theme of trust and interest in technology emerged, with some viewing humanoid robots as more interesting due to their advanced technological nature: "*I can think like this, the more humanoids they can produce, the more technologically superior they are*". Ethical Concerns: Some participants expressed ethical concerns about humanoid robots, fearing issues like human replacement or mimicking human emotions: "*I want a robot that is not humanoid. Serious problems, including ethical problems, may arise when it is desired to install other humanoid features*". Regarding the question, "Does the gender of the service robot affect the satisfaction with the service provided?", the majority of participants stated that robot gender did not affect their service experience, reasoning that robots are machines and gender is irrelevant to service quality. However, one participant noted a tendency to be more polite to a female robot and react less to potential mistakes, indicating that gender roles and perceptions could influence robot interaction. Finally, for this theme participants were asked, "To what extent would you prefer the service robot to have humanoid characteristics?" According to the answers, three sub-themes emerged: Varied Preferences: Participants' preferences ranged from being partially or completely human-like to being completely machine-like. Some expressed a preference for balance. Functionality Priority: Some participants prioritized robot functionality over human-like appearance. Limited Humanoid Features: Others preferred robots with limited humanoid features, such as "*Appearance, cute, maybe eyes or arms, humanoid voice, tone of voice, I think it is enough*". Context-Specific Design: Many advocated for design tailored to the service area: "*I think it should be designed in line with the service it provides*" and "*The service robot should have humanoid features enough to have the features that can best perform the service it will provide*". Findings suggest a preference for robots to be machine-like for functionality and speed, but human-like for communication and emotional characteristics.

4.4. Findings Related to the Service Failure Theme

The fourth theme explored participants' reactions to service robot errors and expectations for compensation The first question for this theme was, "What kind of reactions do you give if you encounter an error while receiving service from the service robot? How do these reactions change according to the type and severity of the error?" According to the answers, the sub-themes emerged below:

Severity-Dependent Reactions: Reactions varied based on error type and severity. Participants were generally understanding of minor errors but would react more strongly to significant or damaging ones. The robot's machine nature also influenced reactions, with comments like "*It depends on how important the error is*", "*It varies according to the size of the error*" and "*I react the way everyone reacts according to the severity of the error*". Understanding and Tolerance: Many participants were understanding and tolerant, acknowledging that "*After all, it is a robot and mistakes can happen, so I try to be understanding*". Harsh Reactions for Major Errors: For major or damaging errors, participants reported harsher reactions and demands for compensation. Errors could also lead to a loss of trust and a desire to cease using the service. Reporting to Authorities: Most participants preferred to report errors to authorities or contact the seller. Type of Error Matters: The type of error was as crucial as its degree. Participants reacted more severely to errors posing health and safety threats. Blaming Manufacturers: Some participants stated they would blame the manufacturer, not the robot, directing their reactions towards the producers. The final question for this theme was, "After a mistake made by the service robot, how do you expect this mistake to be compensated? Which steps would you be satisfied if the error is compensated?" According to the answers, the sub-themes emerged below: Varied Compensation Expectations: Expectations for compensation of the participants varied by error type and severity. Simple apologies and corrections were sufficient for minor errors, while major errors warranted more comprehensive compensation (e.g., human support, financial compensation, gift vouchers). Preventing recurrence and problem resolution were also important. Apology and Correction: For minor mistakes, simpler reparations were expected: "*It is enough for them to apologize and not to make the same mistake again*", "*It would be enough for me if they apologize for correcting the mistake*" and "*It would please me if they apologize*". This was perceived as the robot acknowledging the error and taking responsibility. Human Support: For significant errors or complex problems, most of the participants expected human support and communication: "*It would be nice to talk to a real human being*", "*Under these circumstances, I would expect the error to be compensated directly with the support of a*

human official" and "*I would expect a direct and higher compensation by the employer or managers*" can be listed as examples. Error Prevention and Resolution: Participants prioritized preventing error recurrence and ensuring problem resolution. Financial Compensation: In cases of very important and major mistakes, some participants suggested financial compensation options like direct payments or gift vouchers. Quick and Inexpensive Compensation: Findings indicated a preference for quick and inexpensive compensation. Complaint Communication Methods: Participants reported using various methods to communicate complaints, including direct company communication, social media, customer service, and, for serious issues, legal processes. Direct communication with company officials was preferred for swift and effective resolution. Social media was widely used to publicize complaints and pressure companies, particularly for negative experiences. Legal steps were considered a last resort to protect rights in unresolved or serious cases.

4.5. Findings Related to the Theme of Word-of-Mouth Marketing and Satisfaction

The fifth theme explored word-of-mouth marketing and satisfaction. To the question, "How do the people around you view service robots? Does this affect your decision?", for this theme, participants stated that the experiences and comments of others would influence their decision to use robots. According to the answers for this question, the sub-themes emerged below:

Influence of Others' Experiences: Positive user experiences and trusted opinions played a significant role for the participants. Statements like "*Positive statements of those who have used it before are effective*" and "*I consult the opinion of my acquaintances who have received service*" highlighted this. Diverse Perspectives: Participants believed that people around them would have varied perspectives based on their interest in technology, age, and experience. Those interested in technology would be excited, while those accustomed to traditional service might hesitate. P20 remarked: "*People around me may have different perspectives on service robots. While those who are interested in technology may find it exciting and innovative, some may be distant due to the decrease in human interaction. Especially those who are used to traditional service may be hesitant about whether robots will be warm and understanding enough. Whether it would influence my decision would depend on experience. If the robots are really functional and practical, I may prefer to use them regardless of the opinions of those around me*". Advice and Criticism: The advice and criticism from their social circle were deemed important for some: "*I can use it on the advice of the people around me*" and "*Logical suggestions, criticisms and warnings affect it*" can be listed as examples. Independent Decisions: Many participants, however, asserted that their own decisions would

not be swayed by external factors. Technology Predisposition: Participants believed that others' predispositions to technology would shape their views, with tech enthusiasts being positive and others abstaining. Age was also thought to influence usage. When asked, "After receiving service from the service robot, would you be likely to share this experience with your environment? In which situations would you give positive or negative feedback?", the majority indicated a high likelihood of sharing their service robot experiences. The decision to provide positive or negative feedback depended on the quality of the experience, robot characteristics, and personal experiences. Positive Feedback Triggers: Factors such as service quality, functionality, intelligence, and physical characteristics of the robot triggered positive feedback. Negative Feedback Triggers: Robot errors, malfunctions, lack of information, mobility issues, personal data privacy concerns, and high price led to negative feedback. Objective Sharing: Some participants stated they would objectively share both positive and negative aspects of their experiences. Following this, participants were asked, "What is your tendency to share your experience with the service robot on social media or other online platforms? What kind of content do you create when sharing (text, photos, videos, etc.)?" Most intended to share their experiences on various social media channels, generally planning to use diverse content types such as video, photos, and text. Finally, in response to "How much does your satisfaction with the service robot's service affect your recommendation of this technology to other people? Which elements would you emphasize while recommending?", the majority stated they would recommend the technology if satisfied. Recommendation Drivers: Key factors emphasized in recommendations included the robot's functionality, speed, reliability, ease of use, intelligence, and humanoid features. Thus, satisfaction significantly influenced recommendation tendency and word-of-mouth marketing. Functional and Practical Benefits: The practical benefits of robots in daily life, speed, and efficiency enhanced their recommendability. Reliability and Security: Robot reliability and security, especially regarding personal data protection, emerged as crucial. Ease of Use and Accessibility: Ease of use and accessibility were important, particularly for those less familiar with technology, enabling wider recommendations. Visual and Aesthetic Appeal: For some, the robot's visual and aesthetic features were also significant, with an attractive robot leaving a more positive impression. Negative Experience Impact: Some participants stated they would not recommend the robot if they had negative experiences.

5. Conclusion and Recommendations

This study aimed to determine the impact of service robots' humanization and humanization degree on customer technology adoption, the role of service errors in word-of-mouth

marketing, and their effect on satisfaction. The unique contribution of this research lies in its comprehensive examination of these variables together. According to the results the participants' demographic profile, relationship with technology, and awareness of service robots offer crucial insights into the future potential of this technology.

The majority had a positive relationship with technology, viewing it as integral to daily life. While service robot awareness varied, most had visual exposure to the concept through various sources but lacked physical interaction. Their perspectives on receiving services from robots diverged, mirroring findings in prior literature (Leite et al., 2013; Du, 2020). Opinions also varied regarding robot usefulness, perceived risks, and their predicted impact on the service sector. Most participants recognized benefits like time savings, fast service, and practicality, yet simultaneously perceived risks such as technical errors, security, and privacy concerns.

These results align with studies on the Technology Acceptance Model and Diffusion of Innovations Theory (Davis, 1989; Rogers, Singhal, & Quinlan, 2014; Venkatesh & Davis, 2000). Participants' positive relationship with technology forms a strong foundation for service robot adoption. However, their varying levels of knowledge and experience with service robots significantly influence acceptance. Concerns about potential risks—including unemployment, reduced human interaction, and loss of control—are decisive in participants' decision-making. Conversely, advantages like time savings, practicality, efficiency, and convenience for individuals with disabilities encourage robot use. Perceptions of service robot usefulness depend on how well the technology meets individual needs and expectations, with features like fast, accurate, error-free service and a user-friendly interface increasing acceptance. However, risks such as technical errors, security and privacy concerns, communication problems, and unknown dangers must not be overlooked. Participants anticipate significant changes in the workforce and employment structure within the service sector, predicting both positive effects (new employment, productivity, cost reduction) and negative ones (unemployment, reduced human interaction).

The decision to use service robots is shaped by factors like price, accessibility, need, technological maturity, user experiences, and personal preferences, with social influence playing a partial role. Robot suitability for purpose, sector, and cultural characteristics also impacts attitudes, consistent with studies by Choi et al. (2020), Tuomi et al. (2020), Fernandes and Oliveira (2021), Leong and Zhang (2024), Murphy et al. (2017), and Başer and Bakırtaş (2023). Participants exhibited diverse expectations regarding robot design and anthropomorphism. While some preferred a humanoid appearance, others favored a machine-

like aesthetic. Robot social abilities, conscious behavior, and personality emerged as crucial factors influencing the service experience. The design and humanoid features of service robots significantly impacted participants' perceptions. Humanoid appearance, social abilities, and emotional responses could foster a more natural and enjoyable interaction. However, excessive humanization led to discomfort, fear, eeriness, and distrust, consistent with Mori's (1970) Uncanny Valley Theory. Participants' spontaneous use of words like "*disturbing*", "*frightening*" and "*scary*" as humanization increased supports the Uncanny Valley Theory (Mori, 1970; Geller, 2008; Wan & Chen, 2024). A machine-like appearance, controlled abilities, and logical responses reinforced perceptions of reliability and functionality, aligning with findings from Kwak (2014) and Fernandes and Oliveira (2021). Robot personality, reactions, and level of consciousness significantly influenced the service experience and reliability perceptions. The context and situation of service delivery determined the importance of humanoid characteristics and reactions, echoing studies by Barnett et al. (2014) and Başer and Bakırtaş (2023).

The study also examined participants' expectations for compensation in cases of service robot failures and their preferred complaint communication methods. While compensation expectations varied by error type and severity, apologies, corrections, human support, and financial compensation were commonly expected. Direct communication, social media, customer service, and legal processes were preferred for complaints. These aspects are critical for customer satisfaction and word-of-mouth marketing. Satisfaction with service robots significantly influenced the likelihood of recommending the technology to others. Functionality, speed, reliability, ease of use, intelligence, and humanoid features were key elements emphasized in recommendations, indicating their direct impact on customer satisfaction. Social media emerged as a vital platform for experience sharing and word-of-mouth marketing, with participants indicating they would share both positive and negative experiences. This finding is consistent with Chang et al. (2024). This study reveals varying and multifaceted perceptions and expectations toward service robots. Technology adoption, anthropomorphism, robot design, service failures, word-of-mouth marketing, and satisfaction were identified as crucial factors for the future success of this technology. For service robots to gain widespread adoption, participants' concerns must be addressed, their expectations met, and a reliable service experience provided. Based on this, the following recommendations can be expressed for practitioners and academics.

The design and functionality of service robots, along with their social capabilities, should be meticulously planned based on user needs and preferences. In the event of service failures,

businesses should establish rapid and effective compensation mechanisms, take complaints seriously, and prioritize maximizing customer satisfaction. Social media and word-of-mouth marketing should be leveraged effectively to promote and popularize service robots. When designing and developing service robots, user expectations and concerns should be paramount. The balance between humanoid and machine-like appearance should be tailored to the target audience and service nature. Robot social abilities and personalities should be designed to enhance user interaction. The reliability and safety of service robots should be prioritized to build user trust. Necessary measures must be implemented to prevent technical errors, data privacy breaches, and security vulnerabilities. The human factor should not be completely eliminated; robots should work in harmony with human employees. Word-of-mouth marketing should be encouraged to accelerate service robot adoption. Future researchers should explore new topics based on these findings. While this study employed a qualitative approach, quantitative methods with larger samples could be conducted. Cross-cultural comparisons of attitudes towards service robots among different demographic groups and cultures would be valuable. The effects of humanoid features and robot design on user experience, brand loyalty, and other metrics can be further investigated. Ethical and legal aspects of service robots warrant further exploration. The impacts of service robots on labor force, employment, and the economy, as well as their effects on social interaction, loneliness, and isolation, could be studied. Research on the social acceptance and integration of service robots is also recommended. Finally, interdisciplinary studies on service robots, involving experts from fields like engineering, psychology, sociology, and marketing, would be beneficial. The primary limitation of this study was the short data collection period.

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