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ISTANBUL SABAHATTIN ZAIM UNIVERSITY
GRADUATE EDUCATION INSTITUTE
DEPARTMENT OF BUSINESS ADMINISTRATION

ANALYZING THE EFFECTS OF ARTIFICIAL INTELLIGENCE SUPPORTED ROBOTIC SERVICES IN ISTANBUL RESTAURANTS: A STUDY ON ENHANCING CUSTOMER SATISFACTION AND EMPLOYEE EXPERIENCE

MA THESIS

Hebah Ahmad Ali Farid QASIM

Istanbul
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DECLARATION OF SCIENTIFIC ETHICS AND ORIGINALITY

I hereby certify that this MBA thesis dissertation titled “Analyzing the Effects of Artificial Intelligence Supported Robotic Services in Istanbul Restaurants: A Study on Enhancing Customer Satisfaction and Employee Experience” is my original creation, adhering to scientific ethics and academic standards throughout its development. All data and information incorporated have been gathered and employed in accordance with recognized scientific practices and the thesis writing guidelines established by Istanbul Sabahattin Zaim University. Every direct or indirect quotation and all sources utilized in this work have been meticulously documented within the text and bibliography.

Hebah Ahmad Ali Farid QASIM

Istanbul, June 2024

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ABSTRACT

ANALYZING THE EFFECTS OF ARTIFICIAL INTELLIGENCE SUPPORTED ROBOTIC SERVICES IN ISTANBUL RESTAURANTS: A STUDY ON ENHANCING CUSTOMER SATISFACTION AND EMPLOYEE EXPERIENCE

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With the growing influence of robots in shaping consumer service interactions, businesses are compelled to adjust to this evolving AI-centric commercial landscape. Despite numerous hospitality brands integrating automated robot systems, there is scarce research available on the effects they have on customer contentment and employee engagement. This research investigates the correlation between perceived usability, utility, and enjoyment on satisfaction and continuity of experience during interactions with service robots in Istanbul eateries, along with the impact of different consumer and employee traits on satisfaction levels.

A study was conducted involving 156 diners and 15 restaurant staff members, where a combination of quantitative and qualitative approaches was used. The qualitative segment involved interviews with employees regarding their thoughts on collaborating with robots, while the quantitative part focused on gauging customer opinions. Findings suggest that the reception of restaurants with robot assistance by patrons depends on factors such as perceived utility and user-friendliness, with age playing a significant role in satisfaction levels. Primary services were preferred across various service tiers, and overall satisfaction was linked to the likelihood of recommending the experience.

Suggestions involve fostering cooperation between policymakers, tech experts, and business leaders to boost the effectiveness of current technologies and encourage inclusivity for the elderly. Resolving satisfaction gaps among customers and staff can

maximize the utilization of robots in dining establishments. The findings of this research are beneficial for professionals, scholars, and decision-makers aiming to explore and capitalize on the capabilities of robots in the hospitality sector.

Key Words: Service Robots, Hospitality Industry, Customer Satisfaction, Employee Experience, Technology Acceptance, Service Level Theory.

ÖZET

İSTANBUL'DAKİ RESTORANLARDA YAPAY ZEKA DESTEKLİ ROBOTİK HİZMETLERİN ETKİLERİNİN İNCELENMESİ: MÜŞTERİ MEMNUNİYETİ VE ÇALIŞAN DENEYİMİNİN GELİŞTİRİLMESİ ÜZERİNE BİR ÇALIŞMA

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Tüketici hizmetleri etkileşimlerini şekillendirmede robotların etkisinin artmasıyla birlikte işletmeler, gelişen yapay zeka merkezli ticari ortama uyum sağlamak zorunda kalıyor. Çok sayıda konaklama markasının otomatik robot sistemlerini entegre etmesine rağmen, bunların müşteri memnuniyeti ve çalışan bağlılığı üzerindeki etkilerine ilişkin çok az araştırma bulunmaktadır. Bu araştırma, İstanbul lokantalarındaki servis robotlarıyla etkileşimler sırasında algılanan kullanılabilirlik, fayda ve keyif ile memnuniyet ve deneyimin sürekliliği arasındaki ilişkiyi ve farklı tüketici ve çalışan özelliklerinin memnuniyet düzeyleri üzerindeki etkisini araştırıyor.

Nicel ve nitel yaklaşımların bir kombinasyonunun kullanıldığı, 156 olası restoran müşterisini ve 15 restoran personelini kapsayan bir çalışma gerçekleştirildi. Niteliksel bölüm, çalışanlarla robotlarla iş birliği yapma konusundaki düşüncelerine ilişkin röportajları içeriyordu; niceliksel bölüm ise müşteri görüşlerini ölçmeye odaklandı. Bulgular, robot destekli restoranların müşteriler tarafından karşılanmasının, algılanan fayda ve kullanıcı dostu olma gibi faktörlere bağlı olduğunu ve memnuniyet düzeylerinde yaşın önemli bir rol oynadığını göstermektedir. Birincil hizmetler çeşitli hizmet katmanlarında tercih edildi ve genel memnuniyet, deneyimin tavsiye edilme olasılığıyla ilişkilendirildi.

Yeniden ifade edilen Öneriler, mevcut teknolojilerin etkinliğini artırmak ve yaşlılar için kapsayıcılığı teşvik etmek amacıyla politika yapıcılar, teknoloji uzmanları ve iş dünyası liderleri arasındaki iş birliğinin geliştirilmesini içerir. Müşteriler ve personel

arasındaki memnuniyet uçurumunun çözülmesi, yemekhanelerde robotların kullanımını en üst düzeye çıkarabilir. Bu araştırmanın bulguları, konaklama sektöründe robotların yeteneklerini keşfetmeyi ve bunlardan yararlanmayı amaçlayan profesyoneller, akademisyenler ve karar vericiler için faydalıdır.

Anahtar Kelimeler: Hizmet Robotları, Konaklama Endüstrisi, Müşteri Memnuniyeti, Çalışan Deneyimi, Teknoloji Kabulü, Hizmet Seviyesi Teorisi.

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LIST OF ABBREVIATIONS

EAL: Experience Acceptance Level

EE: Experience Expansion

ES: Experience Satisfaction

PE: Perceived Enjoyment

PEOU: Perceived Ease of Use

PU: Perceived Usefulness

TAM: Technology Acceptance Model

CHAPTER I

INTRODUCTION

1.1 Introduction

1.1.1 Services Automation

Today's Fourth Industrial Revolution brings major technology improvements. One and most significantly is robots in the service industry. These ‘service robots’ work alone, that they rely on a computer and do not need human help or commands (Colby, Mithas, & Parasuraman, 2016). According to Wirtz (2018), a service robot is a machine that makes decisions on its own and it interacts with, communicates, and serves a company's customers. As this technology becomes more achievable, it is getting more attention. Both researchers and business professionals are becoming more interested (Jang & Lee, 2020). Some of the current research on robots consists of review articles and proposal papers with recommendations or guidelines for the hospitality sector (Zhu & Chang, 2020). Why are researchers examining these topics as robotics grows in the industry? They analyse things like people's perceptions, attitudes, and preferences about robots at restaurants (Zemke et al., 2020), they look at how service robots and humans interact (Fusté-Forné & Jamal, 2021); general managers viewpoints on restaurant service robots including an exploration of TAM (Lee, Lin, & Shih, 2018); and even consider robot service failures (Ho, Tojib, & Tsarenko, 2020; Leo & Huh, 2020).

Automation-based services are proliferating across numerous industries, displacing human labour in different domains and, as a result, lowering wages and reducing the demand for human labour. Proponents and opponents of using robots instead of humans in customer-facing jobs have strong points. The impact is notably pronounced within the hospitality realm especially as detailed by BaduBaiden and colleagues (2021). Robots play a pivotal role in elevating the perceived service quality for customers. They offer a myriad of advantages including ensuring service consistency decreasing wait times providing a welcoming environment and enhancing productivity all highly valued by the hospitality sector according to Qiu and team (2020). But some people think robot technology can cause issues, like job loss or unemployment. Notable rewards of robots include decreased labour costs and increased productivity

(Ivanov & Webster, 2017). Average labour costs in restaurants make up around 30% and 35% of the total income, thus restaurateurs are relieved when labour costs are significantly reduced. The labour-intensive work environment of the restaurant industry is one of its unique features (Pan et al., 2015). Robots are key in improving customer service, helping businesses thrive (Ivanov, Webster, & Garenko, 2018). Robots, thanks to technology advances, can oversee basic work just like humans. Still, they fall short in certain hospitality industry elements. Specifically, peoples' unique touch (Kattara & El-Said, 2013), customization (Ariffin, 2013), and maintain high service quality (Choi et al., 2019).

Within 15 to 20 years, automation is expected to replace 14% of low-wage, unskilled jobs currently held by humans. From an additional perspective, though, the "robot economy" is expected to provide about hundred and fifty million new jobs within three years, while almost seventy-five million positions would be automated. Consequently, we are expecting more jobs because services with robots are growing. Lots of studies talk about service robots, especially in services management. Because robots are growing fast, more research is being done to understand what consumers think about these robots (Chang & Kim, 2022; Kim, Schmitt, & Thalmann, 2019; Liu, Wan, & Yi, 2022a; Lu, Zhang, & Zhang, 2021).

By appearance, human-like and non-human service robots can be divided (Gong & Nass, 2007; Yam, Bigman, & Gray, 2021). Human-like service robots are advantageous according to prior studies on anthropomorphism and robots, which indicates that their human-like characteristics (motion and appearance) by presenting them as beings' service robots can seem more relatable, to customers leading to better acceptance and reviews (Van Doorn et al., 2017; Van Pinxteren et al., 2019). As a result, customers might have a response leaning towards service robots that bear similarities to humans rather than those that do not (Li, Rau, & Li, 2010). Despite the cost-of-service robots being four times more, than non-humanoid ones some restaurant proprietors are still willing to consider using them.

The increasing integration of service robots for personal tasks signifies a remarkable uptick showcasing a growth rate of thirty percent. It is projected that by three years the global service robot market will yield revenues of thirty billion United States Dollar accompanied by the installation of a million robots (Marr, 2019). This surge in service

robot adoption outpaces the growth rate of the manufacturing sector by sevenfold highlighting the escalating demand, for service robots (Insider, 2015).

1.1.1.1 Automated Restaurants

Robot-focused service in restaurants is becoming more common, many are opting for automation-based services. The rise in service robots is considered a major worldwide trend (Akdim, Belanche, & Flavián, 2021; Lu, Zhang, & Zhang, 2021). Robotic restaurants are now making headlines globally. So, what is a robotic restaurant? It's a place where robots take over human tasks, they do everything from ordering to cooking, to hosting and even delivery (Hwang, Park, & Kim, 2020; Ivanov & Webster, 2019b), these robots are a replacement for many tasks usually done by employees (Andreassen, Van Oest, & Lervik-Olsen, 2018). Robotic integration into the dining scene is poised to usher in a new era for restaurants. Recent advancements in robotics and automation point towards a paradigm shift in the industry showcasing improved efficiency consistency and quality in food production processes as elucidated by Bader & Rahimifard (2020). This advancement also leads to reduced waste and delicate handling of food items supporting the achievement of Development Goals (Guenat et al., 2022; Pettersson et al., 2011).

When it involves repetitive and fast tasks that require a lot of physical effort, robots have many impressive advantages, especially with regards to repetitive tasks that involve quick movements as well as continuous contact with foodstuffs. This has the potential to streamline processes and reduce manual labour among other things. Reducing waste and environmental impact can also enhance the process flow, increase productivity, improve security, safety, and health care services. Besides, all the benefits herein can be sustained for twenty-four hours each day since there are no requirements for robots to take breaks for toilets or rest or lunch which is associated with an increased hourly production as well. However, when prepared by a robotic chef food quality remains constant even though it may vary depending on the condition of a chef. Therefore, this robotic server will never fail to address any customer's order or request hence may offer unique services. Introducing robotic chefs or servers is a strategic decision embraced by many restaurant owners to drive cost savings while enhancing operational efficiency as per Chuah Aw & Chengs (2021) investigation. Furthermore,

cooks are often injured during cooking accidents; thus, a mechanical one could save lives in such cases (Jeong, 2015). Robots can replace humans in hazardous environments leading to both physical and psychological stress. The labour shortages that the hospitality industry is currently experiencing, specifically within the food carrier region, some other element contributing to the recognition of service robots, since using these robots has proven to provide an ideal solution (Ma et al., 2021). Robotic restaurants are being deployed all over the world owing to the advantages.

The global food robotic market was estimated to be worth two billion United States Dollar four years ago and is projected to grow to four billion United States Dollar within three years, because of recent marketing study. In addition to saving labour costs and streamlining services, service robots are a crucial marketing tool that attract in customers (Ivanov & Webster, 2020; Shin & Kang, 2020). It is not just in the future we might counter restaurants where robots manage the cooking and service, it is a reality that is emerging, as restaurants are starting to use these robots as well. For example, there is a robot kitchen chef with two robot arms, chefs in keeping with a given recipe and is available on the market (Holley, 2018). In a similar vein, another robot is in an eating place offering a robot kitchen, serves delicacies in few minutes. In the eating place industry, fast-meals restaurants were a few of the first adopters of self-provider era. Back in the 1990s a beloved restaurant made waves by introducing self-service ordering kiosks for burger aficionados. Unfortunately, the initial rollout fell short of expectations. Undeterred the establishment overhauled its self-service ordering technology reimagined the user experience and eventually made a triumphant comeback.

1.1.1.2 Robotic Services and Artificial Intelligent

AI-fueled service robots are akin to specialized assistants designed to aid individuals much like- advanced sidekicks. These robots can sense and understand external stimuli, grasp information from their surroundings, respond like humans, and learn from experiences (Bowen & Morosan, 2018). In other words, they have high degrees of independent intelligence and decision-making abilities skills utilized in unpredictable situations. However, this robotics and AI aspect may provoke adverse

feelings, potentially causing customers to have lower adoption intentions for autonomous technology (Sanders et al., 2017).

In recent times technology has seen immense advancements in consumer markets. AI has now become prevalent across various business sectors such as healthcare finance automobile and entertainment due to its precision efficiency increased productivity and cost effective workforce replacement options. Furthermore, AI technologies have rapidly altered the landscape of service interactions (Huang & Rust, 2018; Li et al., 2021). As a significant AI innovation service robots are mechanical devices crafted to undertake physical tasks (Belanche et al., 2020), including providing autonomous or semiautonomous customer support (Haidegger et al., 2013). When compared to human workers AI technologies empower service robots to deliver services with enhanced productivity effectiveness and efficiency (Calderone, 2019).

1.1.1.3 Robotic Services and COVID-19 Pandemic

The COVID19 rollercoaster really messed with what people liked. Back in the day most were all about those human services. But bam! When the pandemic showed up uninvited preferences took a sharp turn (Al-Mughairi, Bhaskar, & Alazri, 2021; Badu-Baiden et al., 2021). There was a big drop in customers across hospitality industries like restaurants (García-Gómez et al., 2021; Hou, Zhang, & Li, 2021; Lee, Lee, & Kim, 2021; Salem et al., 2021; Wan, Chan, & Luo, 2020). Fear of getting the virus made people want restaurants with less human contact. Demand rose for places with robot services. Some say that higher awareness of health risks means a permanent mindset change for hospitality (Wang & Wang, 2021). The pandemic risk is so ingrained that people act cautiously even after the virus fades. So as Demaitre (2020) states, more restaurants will adopt robot services due to their growing popularity.

Plus, COVID-19 sped up the dislike for services needing lots of human contact. Employee interactions could spread the virus during the pandemic. So, service robots can reduce human transmission risk and make dining safer (Romero & Lado, 2021). It makes sense that replacing human workers with robots could lower infection risk, especially in high contact hospitality services. Restaurants used service robots more during COVID-19 to cut human contact while boosting safety and cleanliness. Service

robots create new customer-employee-tech interactions and resulting experiences (Kunz, Heinonen, & Lemmink, 2019).

1.1.2 Technology Acceptance Model

The Technology Acceptance Model (TAM) is like the Swiss Army knife of tech theories showing us the ropes on how folks jump on the latest gadgets. Essentially when something like an app or a gadget seems pretty handy and a breeze to handle it's more likely that people will give it a shot. However while TAM has a solid track record in predicting how we embrace tech advancements the realm of service robots is well somewhat uncharted territory (Park, Park, & Heo, 2018). Extending TAM by incorporating new variables could provide deeper insight into the psychological factors driving perceptions of robot restaurants. TAM research shows consumers likely adopt technology viewed as feasible and easy to use, developing favorable attitudes toward it (Davis, Bagozzi, & Warshaw, 1989; Stock & Merkle, 2017).

The researchers employed the (Artificially Intelligent Device Use Acceptance) AIDUA model to identify the pivotal elements that predispose individuals to be inclined towards the use of AI devices. They found expectancy ulting from performance expectancy, positively influences intentions to accept AI devices. Additionally, they proposed hedonic motivation and social influence positively affect performance expectancy. Moreover, Ho, Tojib, and Tsarenko (2020) highlighted managing service failure, examining whether human employees, service robots, or fellow customers are most effective for service recovery. Their findings suggest customers view human employees and robots more favorably than fellow customers for service recovery, indicating service robots could replace human employees.

1.1.3 Customers' Technology Adoption

Service robots necessitate substantial financial commitment to implement as they represent a modern technological solution. However customers must embrace and adapt to the latest innovations to fully capitalize on the benefits of service robots. Each guest arrives with unique expectations and attitudes towards hospitable robot services during their stay influenced by their individual perspectives on emerging technology. A nuanced comprehension of diverse customer types and their visions for robotic

assistance is imperative, as achieving this requires significant allocation of resources and endeavor from institutions. Can individuals who enjoy robotic services develop new understanding and become more curious about robotic technologies? Do interactions like this improve how customers perceive and utilize AI-enabled solutions? For example, does this increase their openness to embracing contemporary technologies in both professional environments and daily routines? (Parasuraman, 2000)

1.1.3.1 Customers' Motivation

Exploring why consumers are motivated to utilize pioneering services such as robotic restaurants is paramount (Hwang, Kim, & Kim, 2019). Motivation encompasses both internal desires and external factors that drive individuals towards achieving their consumer goals serving as a crucial indicator of consumer behaviour (Percy & Rossiter, 1997; Vandecasteele & Geuens, 2010). The depth of product knowledge significantly influences behavioural intentions for new technology-based services like robotic restaurants (Lee & Lee, 2009). Patrons knowledgeable about robotic dining establishments are more likely to recommend them.

Tung and Law (2017) uncovered an evolving research landscape within human robot interaction that highlights the essence of experiences cantered around humanity. Exploring an individual's perceptions of meaningful relationships and their assessment of interaction quality with robots as highlighted by Patompak et al. (2019) provides valuable insights into human robot interaction. Despite the extensive research by scholars like Lee et al. (2012) and the contributions of Nomura & Kanda (2014; 2016) to understanding human robot interactions there remains a notable gap in evaluating the quality of interactions specifically between customers and robots.

Our comprehension of how different methods employed in utilizing service robots can impact customer satisfaction is limited by the lack of emphasis on this perspective. Nevertheless a scarcity of research has investigated from a service design viewpoint how variations in the deployment of service robots might influence customer experience. Owing to the recent emergence of this technology few scientific inquiries have probed customer satisfaction or acceptance of robotic service in dining establishments and no investigations have pinpointed the exact motivators prompting

consumers to opt for a robotic restaurant (Lee, Lin, & Shih, 2018; Park S. , 2020; Seo & Lee, 2021).

There have been only a few studies delving into how customers react after dining with service robots. Most existing research examining customer responses to service robots has centred on groups of diners. However, there remains a significant gap in understanding the behaviours and decision-making processes of individuals dining alone at restaurants employing service robots. The population of solo diners who opt to dine by themselves is on a steady incline attributable to demographic changes and the trend towards personalized lifestyles. This emergence of solo diners underscores a critical research area that requires attention (Bianchi, 2016; Her & Seo, 2018).

Recent surveys in the marketing field have uncovered a compelling statistic – a solid 35% of restaurant traffic comprises individuals dining alone. Notably given the current context of the COVID19 pandemic there exists a noticeable gap in empirical studies exploring customer satisfaction and the likelihood of patrons revisiting restaurants with robot service. Consequently, delving into the emerging trend of integrating robotic assistance in the hospitality sector emerges as a critical necessity to safeguard the industry's financial sustainability eventually. The immediate need is to validate and broaden existing insights to craft a comprehensive body of knowledge that can effectively inform industry practices.

1.1.3.2 Customers' Perceived Trust

Trust embodies more than a mere concept; it stands as the foundation of successful interactions particularly in today's digital era. It encapsulates the essential belief that individuals support each other amidst uncertainty and vulnerability (Lee & See, 2004, p. 51). Furthermore trust pervades how people engage with modern technologies influencing their experiences and choices (Hoff & Bashir, 2015). A crucial aspect of fostering trust lies in its impact on people's willingness to embrace autonomous technology leverage its benefits and engage with it effectively (Kessler et al., 2016). Establishing trust serves as a critical pillar in strategies aimed at simplifying complex social and technical landscapes to enhance overall user satisfaction (Gefen, 2000). Understanding the evolution of trust in service robots and its underlying psychological

components holds significant importance. However, the hospitality sector lacks substantial research on customers perceptions of trust regarding service robots.

1.1.4 Product Level Theory

The research conducted in 1975 emphasizes the importance of considering multiple customer needs when developing a product or service. It advocates the incorporation of core, facilitating, and augmented layers in product/service design. A suggestion is made to apply the Product Level Theory to explore the integration of technology and artificial intelligence in the restaurant industry. Delving into the realm of robot applications within restaurant settings spanning across diverse product/service layers and dining stages is a journey highly recommended for exploration. This analysis can help restaurant managers make informed decisions on service design and operation, leading to cost-effective strategies and a deeper understanding of customer experiences.

In robot-operated restaurants, cooking and food preparation are fundamental tasks, while welcoming customers, handling payments, and serving food are supporting functions. Among the intricate dance of clientele and servers whether they be robotic or of flesh and blood and the enchanting aura of the dining setting lies the domain of elevated services (Kotler et al., 2017). Understanding these distinctions is vital for hospitality businesses facing resource constraints, as it guides strategic decisions on integrating service robots and determining the extent of human-robot substitution. Given the significant labor scarcity in the current restaurant sector, this choice carries substantial weight. (Littman, 2021).

1.1.5 Human Employees' Effort and Attitudes Toward Robot Employees

In a scenario where a cashier interacts with an automated checkout machine or a warehouse worker navigates a forklift among delivery robots, the study's authors stress the significance of considering the impact of these robots' performance on human workers. While efficiency is crucial, engineers and managers must also evaluate how working alongside robots influences employees' attitudes towards both the machines and them. The research focuses on the emotional experiences of individuals

collaborating with robots that outperform them, exploring the potential consequences of being outperformed by machines on self-esteem and job satisfaction.

Traditionally, the emphasis in teamwork and collaboration research centered on boosting results and enhancing team cohesion. Yet it is essential to dive deeper into understanding human cognition in order to effectively interact with robotic counterparts and nurture continuous human-robot collaboration. While adept organizations have a history of effectively assimilating cutting-edge technologies into their operations, the emergence of intelligent robots presents a unique and formidable hurdle. Progress in grasping this phenomenon will equip us to confront this challenge more effectively.

1.2 Research Scope

1.2.1 Problem Statement

A pioneering breakthrough awaits in this study as it unveils the innovative advancements in artificial intelligence technology within the restaurant sector. With a fervent commitment to enhancing automation services a deeper understanding of customer satisfaction and the augmentation of dining experiences is on the horizon.

Although the significance of automated restaurants is burgeoning there exists a shortage of studies addressing the impact of these establishments on consumers and human employees. The primary research aim is to probe the influence of robotic services in restaurants on customer satisfaction and employee experiences. To comprehensively evaluate these effects the investigation will adopt a mixed methods research design incorporating both quantitative and qualitative data collection methods. The study is specifically focused on analysing the unique case of Istanbul-Türkiye.

This comprehensive investigation delves into the impact of robot assistance on enhancing both customer satisfaction and employee engagement addressing the ambiguity surrounding robots in the industry. It also explores how the alignment between the robot type customer profile and age group influences satisfaction levels and acceptance rates. The primary goal of this study is to fill an evident gap in current literature with implications expected to be substantial for stakeholders in the business sector.

1.2.2 Questions

Ensuring the validity of research outcomes hinges on establishing strong research inquiries, which will consistently guide the research process aligned with the research objectives. Regular evaluations will be conducted to align the research content and findings with the predefined objectives and questions. The study revolves around addressing five specific research queries.

RQ1. What are the perceptions of customers regarding the use of robotic services in restaurants, and how do these perceptions impact their levels of satisfaction and acceptance of such services?

RQ2. Is there a favourable impact of overall experience satisfaction on experience extension and adoption?

RQ3. What are the perceptions of employees regarding collaborating with robots, and how does this influence their level of job contentment?

RQ4. What advantages and disadvantages come with employing AI-driven robots for service in restaurants? How does the integration of robots in restaurant operations impact the overall service standards and operational efficiency?

RQ5. How can this research offer advantages to restaurant proprietors and supervisors seeking enhancement for their establishments in this industry?

1.2.3 Objectives

This riveting research initiative delves into exploring the impacts of AI-driven robotic services in restaurants across Istanbul on customer satisfaction levels and employee work experience. It aims to shed light on the uncertainties surrounding the influence of robots in this sector. Understanding the effects of technology especially artificial intelligence on both staff and customers in the expanding food service industry is paramount. The comprehensive study employs a mixed methods approach to unveil both the advantages and disadvantages of incorporating automated services in dining establishments. It seeks to provide insights into staff participation corporate culture and overall client happiness.

The core purpose of this study is to aid restaurant owners and managers in enhancing their decision-making processes and gaining a deeper understanding of the impacts of

integrating technology and artificial intelligence in the food service sector. These objectives have been meticulously formulated to tackle the research inquiries outlined below.

1. To examine the perception of customers towards robotic services in dining establishments and its impact on their overall satisfaction with the dining experience.

2. To explore the perspectives of employees on collaborating with robots and its impact on their job satisfaction.

3. To assess both the advantages and disadvantages of utilizing AI-driven robots in restaurant operations, as well as their influence on the overall service quality and efficiency.

4. To offer recommendations to proprietors and supervisors on enhancing the utilization of AI-driven robotic services in restaurant operations.

5. To measure the experience extension intension.

1.2.4 Research Setting

The city of Istanbul, located in Türkiye, presents a valuable opportunity for examination. Among the potential business ventures identified by entrepreneurs and business professionals in this region, the establishment of food businesses stands out prominently. This is evident from the notable surge in the number of restaurants within the vicinity. In previous research endeavours, countries such as South Korea, Taiwan, the United States, and China have been extensively studied regarding the integration of robot services in restaurants (Hwang, Park, & Kim, 2020; Jang & Lee, 2020; Seo & Lee, 2021; Lee, Lin, & Shih, 2018; Park S. , 2020; Qiu et al., 2020), contrasting with the unexplored landscape of the Anatolian region. Therefore, conducting a study in this uncharted territory would offer valuable insights into the applicability of past research findings. Despite the novelty of the concept in this area, Istanbul features a significant number of restaurants already utilizing robotic services. Consequently, an ample pool of participants can be drawn from the patrons of these diverse dining establishments, facilitating a more rigorous examination of the proposed model.

1.2.5 Research Concerns and Limitations

While service robots continue to expand rapidly concerns about their quick adoption especially in customer facing roles persist (Zemke et al. 2020). Unlike robots that operate behind the scenes, service robots directly interact with consumers significantly influencing their service experiences. Prior research has shown that these robots can impact customer satisfaction the likelihood of return visits brand perception and purchasing behaviour (Kanda et al., 2010).

Service disruptions may arise from technical issues with the robots' hardware and software or uncertainties during interactions between robots and humans (Hong & Williams, 2019; Steinbauer, 2012). It appears sensible to suggest that trust and perceived risk significant factors in service robot scenarios with uncertainties should be integrated into the updated TAM model. Acquiring empirical evidence in this realm can be highly beneficial in shaping strategic decision-making for hospitality enterprises. Furthermore the importance of customer satisfaction in restaurant marketing is well documented as it profoundly influences usage patterns intentions and trust crucial for both immediate and long term satisfaction (Han & Jeong, 2013; Jin, Lee, & Gopalan, 2012; Jin, Line, & Merkebu, 2016).

Service robots have become prevalent in various sectors; however certain consumers resist and hesitate to embrace services provided by robots creating a substantial barrier to the incorporation of service robots. Additionally, the use of service robots frequently requires consumer involvement resulting in increased uncertainties in service delivery processes. Recent studies by Fu Zheng & Wong (2022) and Rodriguez (2020) emphasize this phenomenon.

When people encounter challenges while trying to interact with service robots it can be quite a bumpy road. This situation has been vividly illustrated by Kim So and Wirtz (2022). Consumer acceptance of service robots is heavily influenced by how they perceive the robots intelligence social presence and ability to interact socially. Moreover personal traits like readiness for technology and the longing for social connections also shape how consumers view service robots as pointed out by Yoganathan and colleagues (2021).

1.3 Research Rational and Significance

The study delves into the implications of incorporating AI-driven robotic services at various roles within restaurants on customer dining experiences. Additionally, it seeks to analyse how dining experiences may differ when utilizing service robots and their influence on overall dining experience enhancement.

The study's outcomes are poised to offer insights both in theory and practicality. The burgeoning albeit deficient knowledge regarding customer satisfaction and employee experiences in robotic service restaurants is set to benefit significantly from a theoretical perspective. In practical terms the findings of the present study will provide restaurant managers with actionable advice that when put into practice can elevate business performance during an exceptionally turbulent economic landscape. Automated dining establishments will have the capacity to address customer concerns and improve customer attraction based on the recommendations elucidated in this study.

A research project's original value is frequently correlated with the new perspectives or contributions it can provide to the corpus of existing knowledge in its field. The thesis on robot service in restaurants may provide novel values in the following manners:

- Practical insights for the restaurant industry:

Valuable insights may be gained by restaurant managers and owners from the research indicating the potential benefits of incorporating robotic services in restaurants. This information could offer guidance on the costs, advantages, and best practices associated with integrating robots into their operations.

- Advancements in service robotics:

The study could contribute to the field of service robotics, which is expanding, by revealing how robots might be designed and programmed to efficiently serve customers in a restaurant setting. This might result in technological breakthroughs and other uses outside of the restaurant industry.

- Consumer behaviour:

Evaluating customer perspectives on robot service in restaurants provides valuable insights into consumer behaviour and technology preferences. This data can help

businesses across industries adopt modern technologies and guide future research and development efforts in the field.

- Economic implications:

The study might also offer understanding into the economic impacts of introducing service robots in dining establishments, encompassing prospective expenses and benefits for the restaurant sector and society as a whole. Those involved in making policies and decisions within the restaurant field and other industries looking to integrate automation and advanced technologies should consider the ramifications of this choice.

- Overall, investigating automated eateries could introduce novel perspectives and advancements to the current understanding in service robotics, consumer behaviour, and the dining industry.

1.4 Research Project Construction

The research document is segmented into five distinct sections, with each chapter laying the groundwork for the study. The following outlines the five chapters of the research.

Chapter 1: Introduction

The introduction segment of the study provides an overview of the research setting and its extent. It delves deeper into uncovering and establishing the possible trajectory of the entire research endeavour. Within this section, the goals, paired with the research inquiries, are delineated. This section provides a succinct evaluation of the deficiencies found in current literature while also highlighting the reasoning and importance of the research endeavour.

Chapter 2: In-depth Review of Literature

The examination of literature will delve into hypothesis development with a focus on the current research concerning AI-driven robotic services in the restaurant domain. It will showcase real world examples of restaurants employing automated services gathering feedback from patrons and staff members. Moreover, detailed interviews

with restaurant owners and managers will be included. This section of the literature review strives to present an overview of the advancements in AI technology and automation in the restaurant sector. It will also shed light on the prevailing global trends and challenges faced by the food service industry. The focus will be on analysing the advantages and disadvantages of AI-powered automated restaurants, examining its effects on customer satisfaction, employee engagement, and organizational dynamics. Through case studies, the review will present practical instances of the deployment of robotic services in restaurants, accentuating the achievements and hurdles faced by these establishments.

Chapter 3: Research Techniques

The methodology chapter being the third in line delves into explicating the methods and tools employed for data collection and sampling techniques in the ongoing study. Through a combination of questionnaire and interview the goal is to acquire insights from customers employees and restaurant stakeholders regarding the impact of service robots on the restaurant industry. This segment will also emphasize the research's framework and methodology.

Chapter 4: Results and Analysis

This section constitutes the outcomes and analysis segment encompassing data exposition, statistical analysis, result interpretation, and hypothesis elucidation. It will pinpoint the pivotal elements impacting the efficacy of automated restaurant services while succinctly summarizing the research outcomes.

Chapter 5: Conclusion and Recommendation

The final section, known as the concluding chapter, provides a definitive summary derived from the research results. It will delve into a detailed analysis of the research outcomes, reflecting on how they align with the research goals and inquiries to evaluate their achievement. Furthermore, this chapter will propose practical recommendations for both employees and organizations to enhance their implementation strategies, along with suggestions for prospective research endeavors.

CHAPTER II

LITERATURE REVIEW

2.1 Theoretical Background

2.1.1 Artificial Intelligence

The exploration conducted by Shabbir and Anwer in their study delves into the realm of "Artificial Intelligence," which encompasses the ability to acquire and apply specific knowledge and skills to tackle various challenges. Building upon Scherer's research findings dated (2015), it is elucidated that intelligence is predominantly about harnessing fundamental cognitive capacities for problem-solving, learning, and logical reasoning within specific contexts. Additionally, as highlighted in Miller's (2019) study, intelligence is intricately linked to a spectrum of cognitive functions including perception, memory, strategic planning, attention, and language processing. The evolution of intelligence encompasses both artificial intelligence and human cognitive capabilities, where traditional human intellect is strongly intertwined with capabilities such as learning, reasoning, and problem-solving. This multifaceted discussion underscores the interconnectedness of diverse cognitive aspects in shaping intelligence, shedding light on the interplay between artificial and human intelligence in the pursuit of cognitive advancement.

The research conducted by Ertel in (2018), similar to earlier studies, highlighted the wide array of complex behaviours exhibited by individuals that can be easily acquired over their lifetimes. Popenici and Kerr's work in (2017), defines artificial intelligence as the capacity of a machine or computer program to learn and reason. Zeng et al. (2018) describe artificial intelligence as a recognized discipline that merges computing systems to enhance their cognitive abilities, enabling them to function independently without human intervention. Grewal (2014) explored artificial intelligence as an emerging field within computer science, with a specific emphasis on developing intelligent machines.

The study highlighted an emerging emphasis on enhancing intelligence by simulating human thinking and working patterns. Research by Scherer (2015) defined artificial intelligence as a computational field enabling rational decision-making. Similarly,

Miller's (2019) work outlined AI's incremental development, involving perception, analysis, and response mechanisms, distinct from psychology due to its computational approach. It differentiates itself from computer science by prioritizing action, reasoning, and perception. Additionally, findings indicate that AI enhances machine functionality and intelligence (Popenici & Kerr, 2017, pp. 5-10).

Ertel's research in (2018) critically analysed the historical progression of Artificial Intelligence (AI) spanning from the 1950s to the 1980s, a period characterized by the initial stages of enabling computers to emulate human behaviour. Subsequently, the evolution of AI between 1980 and 2010 signalled a transformative era where computational advancements paved the way for machines to achieve autonomous learning capabilities, commonly referred to today as deep learning. Notably, Popenici and Kerr's study highlighted deep learning as a pivotal component within the realm of machine learning that emerged post-2010. Through the seamless integration of deep learning into the machine learning landscape, there has been a significant advancement in the implementation of complex multi-layer neural network computations. This integration has not only revolutionized the field of AI but has also streamlined the process of developing sophisticated algorithms that drive the progression of artificial intelligence technologies. By grasping the historical context and technological shifts outlined in these studies.

Artificial intelligence (AI), according to Zeng et al. (2018), refers to a sophisticated computational technology that plays a pivotal role in customer interaction. This field integrates principles from diverse disciplines, including computer science, engineering, psychology, mathematics, and linguistics. AI not only involves the development of intelligent systems that mimic human cognition but also focuses on enhancing customer. Grewal's study in (2014) emphasized the pivotal role of AI in time-saving capabilities, highlighting its widespread application across diverse sectors. Moreover, the research highlighted AI's efficacy in mitigating workplace stress and underscored its prominence as a dynamic field in scientific advancement. Contemporary scientific perspectives predict a tangible evolution towards integrating AI into tangible technological advancements (Popenici & Kerr, 2017, pp. 5-7).

2.1.1.1 The Impact of Artificial Intelligence on Consumer Behavior

The research conducted by Nadimpalli in (2017) reveals a significant increase in the visibility and importance of artificial intelligence (AI), which has garnered considerable interest across various sectors of society. The recent era has witnessed a heightened focus on AI at a global level, resulting in a rising acknowledgement and adoption of this technological innovation among consumers worldwide. Further delving into the study by Nadimpalli, it becomes evident that the spotlight on AI has become more pronounced in contemporary times, indicating a shift towards a greater recognition and appreciation of its implications and applications. Research by Sun et al. (2019) indicates that the majority of customers have been exposed to AI through media coverage or personal encounters, resulting in a heightened trust in AI, attributed to its positive impacts on consumers. This growing curiosity in the potentials and applications of AI has heightened public awareness and interest in the field, solidifying AI's vital role in the twenty-first century (Mohammed, 2019).

The consumer is actively endorsing the progress of artificial intelligence, as substantiated by Grewal et al. (2018), who revealed that AI is pivotal in surveillant customer segments across social media and digital platforms. These AI-driven systems facilitate customers in easily identifying their individual preferences, thereby enabling them to access tailored advertisements on diverse websites, assisting them in discovering the most suitable products. Additionally, according to Nadimpalli (2017), AI empowers customers to securely store their data online without cumbersome procedures. However, the increasing ubiquity of AI has led to a heightened sense of wariness among customers regarding the technology and its capabilities.

2.1.1.2 The Impact of Artificial Intelligence on Employment Trends

Brougham and Haar (2018) underscored the transformative impact of automation, digital technologies, and artificial intelligence (AI) on conventional workplace routines and the requisites for skills. This shift extends beyond mere advancements to fundamentally reform how tasks are conducted, and the competencies needed to thrive. Therefore, it is crucial to sustain a continual process of adaptation to guarantee the enduring advancement of an organization. Singh (2020) emphasized in a study that digital technologies are pivotal for future economic progress.

In the research conducted by Singh (2020), it is highlighted that the implications of digital technologies, artificial intelligence, and automation are especially crucial for Turkey, given their potential to profoundly reshape the nation's economic landscape. These advancements have the power to revolutionize various sectors within Türkiye's economy, paving the way for increased efficiency, innovation, and competitiveness. The integration of these technologies has the capacity to streamline. Türkiye is urged to thoroughly assess and create awareness regarding forthcoming challenges and prospects to adequately equip its workforce for future changes. The report, based on the knowledge and proficiency of its workforce, highlights Türkiye's initiative-taking approach over the last six months in analysing the productivity enhancements resulting from the adoption of automation, digital technology, and AI across different industries and job roles.

In (2020) Singh highlighted that automation and AI advancements are poised to enhance productivity and benefits in Türkiye by 2030. The research revealed that existing technologies have the capability to automate around half of all occupations on a broader scale. Moreover, current technological advancements suggest that six out of ten job roles in Türkiye could be automated by 30%. Conversely, a recent report from PWC in (2020) emphasized that robotics, AI, and smart automation offer significant potential for driving economic growth and prosperity. The resulting increase in wealth and income leads to a surge in demand for specific roles, raising concerns about the displacement of existing jobs. Evaluations in these countries ascertain the varying degrees of automation potential at distinct phases.

2.1.2 Robotics in Service Encounters

Service robots, according to Engelhardt and Edwards (1992, pp. 315-316), are sophisticated and programmable machines that possess the ability to sense their environment, process data, and execute tasks to aid human endeavours, enhance efficiency, and broaden human capacities. In contrast, as articulated by Wirtz (2018), service robots are autonomous entities driven by system logic, showcasing adaptability and versatility in engaging, communicating, and delivering services to customers within organizational settings. Service robots embody an advanced level of

intelligence and versatility, enabling them to interpret their surroundings, analyse information, and conduct operations that streamline human.

Smart technologies, including artificial intelligence (AI), automation, and robotics, have been the subject of extensive research within the tourism (Tussyadiah, 2020; Yang et al., 2021), and hospitality (Liu, Wan, & Yi, 2022a; Zhang, Balaji, & Jiang, 1969). Noteworthy advancements in the integration of robots into existing service technologies have been witnessed, marking a significant progression (Mende et al., 2019). The utilization of service robots has been empirically investigated in various studies encompassing key areas such as social-cognitive evaluation (Yoganathan et al., 2021), social crowding effects and tourist preferences (Hou, Zhang, & Li, 2021), customer willingness to pay (Ivanov & Webster, 2021), information sharing and empathy (de Kervenoael et al., 2020), as well as robotics awareness (Li, Bonn, & Ye, 2019). The proliferation of robotic service assistants in service processes signifies the rapid transformation of customer-provider interactions propelled by technological advancements. This evolution enables the delivery of services with heightened productivity and efficiency in the era of artificial intelligence (AI). The integration of AI, automation, and robotics has not only reshaped the landscape of the tourism and hospitality industries but has also paved the way for improved service quality and customer experiences. The continuous exploration and implementation of smart technologies underline the ongoing efforts to enhance operational effectiveness and service delivery standards within these sectors.

The utilization of robotics has seen a noteworthy surge in growth within the domains of hospitality and tourism, specifically in the restaurant sector. This emerging trend is supported by a series of recent academic studies (Akdim, Belanche, & Flavián, 2021; Kim, So, & Wirtz, 2022; Lu, Zhang, & Zhang, 2021; Zhang et al., 2021). The incorporation of robotics in the hospitality industry signifies a significant leap in service innovation, underscoring the importance of carefully considering the appropriate roles for robots based on service processes and elements. It is widely recognized that automated services play a pivotal role in enhancing service efficiency and cutting costs (Ostrom et al., 2015). The integration of service robots in customer engagements has witnessed a substantial rise across diverse tourism and hospitality sectors, encompassing restaurants, hotels, and airlines (Ivanov & Webster, 2020; Park S. , 2020; Tung & Law, 2017). Customers now frequently encounter automated service

solutions that replace human labour, such as self-check-in options in accommodations and airlines, food delivery platforms in dining establishments, and self-service checkout systems in retail stores (Andreassen, Van Oest, & Lervik-Olsen, 2018; Chen & Wang, 2016; Cho, Bonn, & Li, 2019). This evolution reflects a transformative shift in customer experiences and operational efficiencies within the hospitality and tourism sectors.

In their recent research, Ivanov, and Webster (2023) focused on uncovering the public's preferences concerning the use of robots within the food and beverage sector. Additionally, Hwang et al. (2022) delved into the implications of incorporating service robots as opposed to human employees in the operation of robotic food establishments, analysing how this impacts the authenticity of such eateries. Furthermore, Liu et al. (2022b) explored the relationship between the perceived traits of robots (being friendly or competent) and the type of service environment provided (whether hedonic or utilitarian), discussing how these elements influence customers' trust levels and their willingness to interact with robotic service providers. Moreover, Huang & Rust's studies (2018; 2021) have exemplified that the integration of robots into various industries, particularly with the advancements in Artificial Intelligence, represents a growing trend that addresses the evolving service demands of modern society. This research underscores the significance of embracing technology, such as AI-driven robotics, to cater to the diverse needs of consumers and enhance the overall service quality in our contemporary world.

Robotic technology has become a focal point in recent research endeavours, with a particular emphasis on its application across various industries. Studies conducted by Ivanov & Webster (2020) have explored the economic implications and benefits associated with the deployment of robots in service-oriented sectors. Additionally, research efforts by Park S. (2020), have focused on the formulation of trust models tailored for service robots, while investigations by Tung & Law (2017) have delved into the dynamics of human-robot interactions. Furthermore, studies by Tung & Au (2018) have examined customer perceptions and experiences concerning the integration of robots in service settings. Moreover, the utilization of service robots in the tourism and hospitality domain for enhancing service delivery, as highlighted by Murphy, Gretzel, & Pesonen (2019), has been a subject of substantial scrutiny. Despite

the extensive scrutiny within the tourism and hospitality sectors, the application of robotic systems in the restaurant industry remains an underexplored domain.

Autonomy is a crucial characteristic that sets service robots apart from other technological advancements, denoting a robot's capacity to adapt to changes in its surroundings (Thrun, 2004). The core characteristic mentioned significantly influences the scope and complexity of assignments that a robot can perform, thereby augmenting its capacity to function efficiently in complex surroundings. This essential trait is crucial in determining the variety and intricacy of tasks that can be undertaken by a robot, leading to improved operational effectiveness in challenging environments. In-depth analysis reveals that this foundational (Beer, Fisk, & Rogers, 2014). Consequently, research has underscored the significance of exploring human-robot interactions to gain insights into user experiences and acceptance levels (Kiesler & Hinds, 2004). Effective communication between a human and a service robot is imperative for facilitating interaction, as per the defined concept (Goodrich & Schultz, 2007).

Human-robot interactions can be categorized into two main types: remote interactions, where the human and robot are physically apart, and proximate interactions, where they are in proximity. In the realm of hospitality and tourism services, the approach of integrating robots alongside individuals or customers in close interactions is viewed as preferable when contrasted with distant interactions. This strategy underscores the significance of enhancing customer experience and personal engagement. The utilization of robots within physical proximity not only streamlines service delivery but also fosters a sense of authenticity.

Service robots are typically classified into two main categories, namely quasi-automated and fully automated, with their automation levels serving as the defining factor (Murphy, Gretzel, & Hofacker, 2017). Quasi-automated robots operate by relying on either human input or pre-programmed self-directed actions to make decisions. On the other hand, fully automated robots exhibit a higher degree of autonomy as they possess the capability to interact with their surroundings autonomously and adapt to environmental changes without the need for external intervention (Li J. , 2015).

2.1.2.1 Benefits of Restaurants automation

Due to their ability to manage various tasks typically conducted by human workers more efficiently, service robots offer a substantial advantage to businesses. The rising utilization of robots in the restaurant industry is particularly noteworthy. Studies indicate that incorporating robots can lead to increased revenue (Chuah, Aw, & Cheng, 2021), enhanced service standards (Morita et al., 2020), positive customer sentiments, and favourable behavioural intentions (Yoo, Kim, & Jeon, 2022). With the capability to operate round the clock and possess superior physical strength and computational speed, service robots are well-equipped to handle hazardous tasks, streamline automated processes, and boost overall operational efficiency within a business (Calderone, 2019).

Automated services in the contemporary business landscape are often perceived by customers as analogous to human services, thereby fostering acceptance and utilization (Choi et al., 2019; Ivanov & Webster, 2019b). As customers progressively familiarize themselves with automated assistance, their comfort levels tend to rise, culminating in substantial long-term advantages for companies in terms of cost-effectiveness and enhanced service excellence (Rust, 2022). The incorporation of robotic technologies holds the promise of streamlining a plethora of services and functions within a robotically operated restaurant. According to Go et al. (2020), robots are proposed as a feasible solution for supporting service providers in executing uncomplicated tasks, with service robots being categorized based on their core functions such as communication, entertainment, delivery, housekeeping, security, as well as guidance. This seamless integration of automation not only augments operational efficiency but also signifies a pivotal shift towards optimizing customer experiences and operational processes within the service industry.

In a similar context, researchers Ivanov and colleagues (2017), Tuomi et al. (2021), along with Zhu with Chang (2020) have extensively documented the multifaceted roles of robots within the hospitality sector. These roles encompass greeting guests, facilitating deliveries, engaging in cleaning tasks, cooking meals, and serving food, all with the overarching goal of enriching the overall dining experience for customers. Furthermore, Hwang and team (2020) have provided a comprehensive overview of the wide-ranging functionalities of robots in restaurant settings. These functionalities include presenting detailed menu information, taking customer orders, delivering

meals to tables, clearing dining areas, and handling payment transactions. This detailed exploration sheds light on the significant contributions that robotic technology offers to streamline and enhance various aspects of operational efficiency in the hospitality and restaurant industries. Zhang and co-authors (2021) propose that service robots can also contribute to disinfection and sterilization tasks. Robotic systems offer several advantages over human workers in operational efficiency, such as cost savings, reduced errors and fatigue, and consistent service delivery. Nevertheless, the vital human-to-human interaction in the restaurant sector cannot be overlooked, despite the potential cost savings and efficiency gains from utilizing robots. Improving the interactive capabilities of robotic servers through technological advancements may pave the way for replacing a sizeable portion of human staff. Integrating robotic services in restaurants offers numerous benefits, as outlined in various literature sources. These advantages are systematically summarized and classified according to the recipients, as depicted in Figure 2.1.

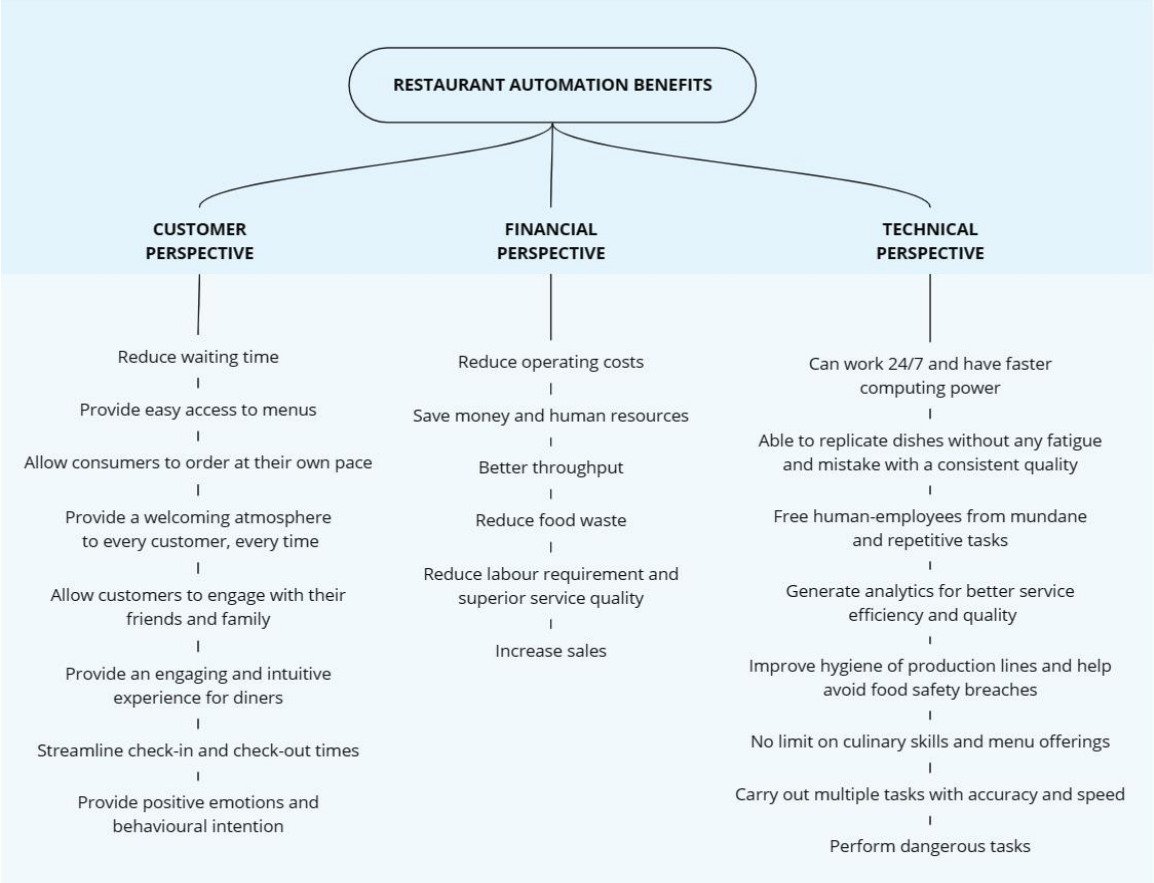

Figure 2.1: An Overview of Applying Robots in Restaurant Operations

Source: Author Finding

2.1.2.2 Case Studies

Despite being in its nascent phase, the robot restaurant sector has commenced operations in a few nations.

a) South Korea

Woowa Brothers Corporation is currently in the process of developing a restaurant that utilizes robotic servers, in addition to their ongoing work on a food delivery application. By integrating robot servers into the restaurant operations, the primary objective is to enable restaurant personnel to redirect their attention towards elevating the quality of food offerings by engaging in tasks like menu development and culinary preparations, thereby relieving them from service-related duties. This advanced technological implementation not only streamlines the serving process but also empowers the staff to allocate more time and effort towards enhancing the overall culinary experience. Customers at this establishment utilize the company's dedicated app for placing orders and making payments. A staff member inputs the table number and entrusts the prepared meal to a serving robot, which then autonomously navigates towards the customer using advanced obstacle-avoidance technology (FN, 2019). In a strategic move beyond their current food delivery operations, the company is also innovating robots for meal ordering and preparation (Hee-jin & Jeehyun, 2019).

b) UK

An autonomous robotic server at Tea Terrace is proficient in autonomously navigating to deliver meals and engaging with patrons in multiple manners, including menu explanations. By handling tasks redundantly performed by humans and transporting weighty dishes, this automated system amplifies workforce productivity. Furthermore, the robot is capable of operating daily, following a consistent work timetable (Smyth, 2019).

c) Scotland

Two robot servers that converse with customers while carrying trays are employed by the Yamm World Buffet restaurant (Howarth, 2019).

d) UAE

A team of robots at Dubai's RoboCafe entertain customers while serving food that customers order through smart devices (Andrews, 2019).

e) US

At the American Spyce eatery, a robotic device adept at flipping burgers is being utilized to not only flip patties but also to address customers, escort them to their tables, and craft customized coffee and burgers as requested. Additionally, Robot Captain Crabs Cajun Seafood & Bar employs a total of five robots collectively known as a "robot clan" fulfilling roles as servers and hosts (Holley, 2019).

f) China

A robotic barista in Shanghai's Ratio café employs an app to learn about each customer's preferred coffee to provide them with personalised service (Hu, 2019). Customer re-visits have increased in all these cases due to the availability of robot services. Although the use of robots to replace human labour can be controversial, these machines have gained popularity among consumers and positive feedback.

g) India and other countries

At 'Robot Restaurants,' patrons have the option to place their food orders through individual tablets at their tables, with a squad of six robots responsible for serving and engaging with them. The advancement of robotic technology in various nations has led to the evolution of robot systems from single-unit configurations to networks of multiple robots working together to provide food service and welcome customers (TET, 2019).

h) Türkiye

Touch Restaurant integrates robotic technology to facilitate meal delivery, customer service, and entertainment. Patrons place orders through a touch screen system embedded in computerized tables (Gill, 2019). Similarly, Big Chefs is an establishment

that leverages robots to greet visitors and serve food. Moreover, numerous dining establishments are adopting smart screens for meal selections. Notably, a quaint eatery with a focus on traditional cuisine offers innovative waiter services using a robot named Pebble, which warmly welcomes guests and assists with meal orders. The robot server Pebbles, swiftly becoming the restaurant's beloved mascot, captivates and amuses customers.

2.1.2.3 Challenges of Restaurant Automation

Restauranteurs are facing a significant challenge as the food industry moves forward to automate, striking a balance between their automated and human employees. How well the restaurant will depend on this challenging balancing act. Beside this difficulty, the food industry will face many limitations and challenges during the process of implementing server robotics.

1. Cost and implementation:

Despite efforts to reduce the cost of robotics products, they remain prohibitively expensive for small boutique restaurants. Simple products typically cost between $1,500 and $3,000, though they are frequently more expensive. The implementation costs for such devices can range from $20,000 to $30,000.

2. Human Supervision:

Restaurant robotics, whether fully or partially automated, still require some level of human supervision. Machine learning has made significant advances, but robots are still unable to adapt to changing situations or read human emotions. These are important considerations affect the overall experience at restaurants. Humans must still supervise these machines to ensure that proper service is provided to customers.

3. Resistance:

While employees may simply protest the loss of their jobs, customers are an entirely distinct matter. The loss of human touch, the layoff of employees, or negative experiences with AI-powered devices may all contribute to resistance to restaurant robotics. Restaurant owners must address all these reasonable concerns. The best scenario is to identify the most pressing issues and implement automated solutions that

will not negatively impact, but rather help to improve, customer satisfaction and guest loyalty.

4. Same Tasting Dishes:

Robots can replicate specific actions with precision, which may become tedious for customers after a while. Unfortunately, teaching robots to learn new recipes is an overly complex task that not all restaurant owners—or machines—will be willing to undertake. Most restaurant robots use machine learning to learn how to cook. This means restaurant owners must provide data that robots can learn to replicate. Without this routine, the robot will continue cooking the same meal indefinitely. Consistency is valuable, but a static menu may drive away loyal customers.

2.1.2.4 Utilizing Service Robots for Marketing Success

Service robots have seen a rise in significance within the realm of marketing, particularly fuelled by the aftermath of the COVID-19 pandemic. Industries such as hospitality and tourism have endured most of the crisis, prompting consumer apprehension when it comes to frequenting busy establishments like restaurants. The utilization of service robots in these sectors has emerged as a viable solution to mitigate health risks and address customer worries related to potential virus exposure. To ensure safety and entice customers, a rising number of global businesses in industries such as restaurants, hotels, and airports have adopted service robots (Funk, 2020; Lyons, 2020; Wan, Chan, & Luo, 2020).

The research conducted by Chuah (2021) delved into the impact of service robots on consumer behaviour amidst the backdrop of the COVID-19 pandemic. The study revealed that customers show a heightened inclination to visit and splurge at eateries that incorporate service robots, primarily driven by a heightened need for maintaining physical distance. This preference stems from a collective consciousness regarding the importance of minimizing close interactions to reduce the risk of virus transmission. In a hotel context, Badu-Baiden et al. (2021). Recent research has uncovered that when the threat of COVID-19 transmission is high, people tend to prefer lodging facilities where robots are in charge rather than those operated by human staff. Additionally, a study conducted by Romero & Lado in (2021) demonstrates that individuals belonging to Generation Z view robots as a practical solution to reducing the risk of COVID-19

transmission. As a result, this demographic group is more likely to choose to stay in hotels that utilize robotic services for various tasks. Therefore, there is both theoretical and practical value in exploring the marketing consequences associated with the integration of service robots in contemporary markets.

The significance of marketing implications in the domain of service robots has garnered considerable attention in recent times, sparking an urgent need for more extensive investigation and analysis in this specific field (Murphy, Gretzel, & Pesonen, 2019). The unique service experiences provided by service robots compared to human counterparts suggest their potential as a marketing asset for customer attraction (Van Pinxteren et al., 2019).

2.1.2.5 Social Entities: Service Robots in the Modern Age

Previous research in the field defines social agents as individuals that consumers interact with during a service encounter and analyses how consumer decisions are impacted by the simple existence of these social agents. Studies by Argo, Dahl, & Manchanda (2005) and Liu & Mattila (2015). have delved into this aspect. Additionally, Van Doorn and colleagues' study in (2017) revealed that service robots incorporating high levels of anthropomorphism create a strong sense of automated social presence, portraying them as "social entities" in the eyes of consumers. This perception results in positive reactions and responses from consumers due to the enhanced human-like characteristics and behaviours exhibited by these robots.

Anthropomorphism refers to the tendency of assigning human-like qualities, behaviours, and traits to non-human entities, especially when these entities display characteristics reminiscent of humans. This inclination becomes more pronounced when non-human agents possess attributes that are typically associated with humans. Recent research by Aggarwal & McGill (2007) and Fan et al. (2020) suggests that this anthropomorphic tendency is heightened when non-human entities bear resemblance to human features. Notably, contemporary studies indicate that social agents can encompass entities generated by technology rather than actual individuals. Despite service robots lacking genuine human characteristics, their human-like features, including appearances, movements, and even names, often prompt individuals to perceive them as social entities resembling humans. Yoganathan et al. (2021)

conducted research revealing that humanoid robots, as opposed to self-service machines lacking human-like features, have the ability to enhance automated social presence. This enhancement significantly impacts consumers' inclination to visit establishments housing such robots. The presence of human-like traits in robots contributes to their perceived social presence, influencing consumer behaviour and interest in engaging with these technologically advanced entities within various service settings.

Anthropomorphism theory has been a focal point in recent research, with findings suggesting that humanoid service robots hold a significant advantage over non-humanoid counterparts in shaping social judgments and influencing individuals' beliefs about the agent. This phenomenon results in more favourable evaluations and responses towards the robots. A study conducted by Kim et al. (2019) exemplified that humanoid robots are perceived as more amiable and easily approachable, thereby fostering the establishment of connections with humans. Moreover, Lu (2021) posited that humanoid robots are commonly perceived as more credible, leading to a positive reception of robotic services within the dining sector. Additionally, research by Yoganathan et al. (2021) showcased that humanoid service robots have the capacity to enhance consumers' expectations of quality and boost their willingness to spend compared to their non-humanoid counterparts. The implications of these studies underscore the pivotal role that humanoid robots play in influencing social interactions and consumer behaviour.

Service robots, with their advanced technologies, have the remarkable ability to simulate social interactions, giving individuals the impression of engaging with sentient beings. This was highlighted in a study conducted by Van Doorn et al. in (2017) and further supported by recent research by Chang and Kim in (2022). These studies demonstrate that consumers perceive service robots not merely as inanimate machines but as social entities they interact with during service encounters. As a result, these robots are subject to evaluation based on the attributes of competence and warmth in the realm of social judgments, showcasing the intricate relationship between humans and artificial intelligence in modern society.

Service robots have gained significant traction across a wide range of service industries in contemporary times, particularly within scenarios involving direct customer interactions. This amalgamation has brought about a shift in how consumers view

these robots, now considering them as "social entities," thereby causing a transformation in the dynamics observed during service encounters (Choi, Liu, & Mattila, 2019; Larivière et al., 2017). People tend to apply their learned social skills and perceptions to interacting with service robots, especially those that exhibit human-like features (Qiu et al., 2020). This integration of service robots into various service settings has notably altered the traditional roles of customers and service providers.

2.1.3 Technology Acceptance Model

In light of the swift advancement in modern technology, making informed decisions regarding the adoption or dismissal of technology plays a pivotal role in its effective integration and utilization. In recent years, researchers have formulated various frameworks to explore the factors influencing individuals' decisions to embrace or decline a specific technology and to pinpoint the factors that precede such acceptance. As indicated by the model, an individual's preferences, and openness to acquiring knowledge and embracing emerging technology are influenced by their perceived benefits linked to the technology. This implies that people's attitudes towards adapting to modern technologies are heavily influenced by the advantages they believe they will gain from utilizing such technologies.

Building upon the renowned Theory of Reasoned Action, Davis (1985) formulated the Technology Acceptance Model (TAM) to gauge individuals' inclination towards embracing computer-based technology. The TAM, rooted in the 'belief-attitude-intention-behaviour' framework, as delineated by Davis (1989) and further elaborated by Park, Park, & Heo (2018), aims to elucidate the adoption of novel technologies through key predictors such as perceived ease of use (PEOU), perceived usefulness (PU), and perceived enjoyment. Extensive studies by Kamal, Shafiq, & Kakria (2020), Kim, Lee, & Law (2008), and Lew et al. (2020) among others, have underscored the significance of these factors in technology acceptance. Initially intended for assessing employees' engagement with technology in professional settings, TAM has transitioned to encompass a broader realm, offering insights into how individuals interact with and embrace specific technologies (De Graaf, 2016). Recent advancements have led to a revised TAM model integrating additional external variables, notably perceived enjoyment (PE), showcasing a more comprehensive

framework for understanding new technology adoption beyond the traditional realms of PEOU and PU (Marangunić & Granić, 2015).

Due to its focus on analysing how individuals interact psychologically with contemporary technologies, the model has found widespread application in the examination of human-robot interactions. According to this model, an individual's preference for a specific behaviour is primarily shaped by how they perceive the effectiveness and ease of use of the technology, as posited in the research by Davis, Bagozzi, and Warshaw in (1992a; 1992b).

The Technology Acceptance Model (TAM) has been extensively utilized in diverse sectors such as information kiosks, mobile banking, and self-check-in services (Lu, Chou, & Ling, 2009; Munoz-Leiva, Climent-Climent, & Liébana-Cabanillas, 2017; Wang & Shih, 2009). While TAM has been a valuable framework, some scholars argue that its application alone may not provide a comprehensive understanding of how new technologies are adopted. To overcome this limitation, previous research efforts have sought to enhance and elaborate upon the TAM model (Al-Gahtani, 2008; Hsu & Chang, 2013; Huang, Lin, & Chuang, 2007). These endeavours have highlighted the significance of concepts like consumer innovativeness in offering deeper insights into the motivations driving the acceptance of modern technologies. By expanding the TAM framework to incorporate factors beyond its original scope, researchers aim to refine our understanding of technology adoption processes and shed light on the complexities involved in embracing innovative technological solutions. This enhanced TAM approach offers a more comprehensive understanding of technology adoption trends (Hwang, Kim, & Kim, 2019).

In the field of hospitality, scholars propose that incorporating additional elements may be essential to comprehensively understand the integration of robot technology. Customers may perceive the efficiency of robotic service as remarkable. Furthermore, the distinctive nature of interactions with robot service could have a positive effect on customer satisfaction (Bello & Etzel, 1985; Duman & Mattila, 2005). While the Technology Acceptance Model (TAM) is frequently studied for technology adoption in the hospitality and tourism industry, there is limited research on its applicability to robotic service in dining establishments. In our research, we have modified and enhanced the TAM to evaluate customer satisfaction and employee engagement, covering overall experience satisfaction and the advancement of robotic services in

restaurants, while maintaining the original factors. This adaptation allows for a comprehensive examination of the impact of robot technology on customer experiences and employee involvement in the dining sector.

2.1.3.1 Models' Main Factors

According to the technology acceptance model, an individual's perception of a technology is influenced by their assessment of its value and user-friendliness (Davis, Bagozzi, & Warshaw, 1989; 1992a; 1992b). Positive attitudes towards adopting a technology are typically rooted in the belief of its practicality and ease of use (Norfolk & O'Regan, 2020). In industries such as hospitality and restaurants, customers' attitudes towards service robots are positively affected by how useful and user-friendly they find them (Parvez et al., 2022). This connection is elaborated upon, and specific definitions are provided in Table 2.1.

a) Perceived Ease of Use

Perceived Ease of Use (PEAU) is a fundamental concept that significantly influences how individuals perceive and adopt technology, serving as a critical determinant for consumers when it comes to embracing new technological advancements (Venkatesh & Bala, 2008). Individuals exhibit a cheerful outlook towards technology adoption when they believe they can quickly grasp its functionality with ease. Conversely, when perceived as complex, individuals are inclined to view technology adoption negatively (Shamdasani, Mukherjee, & Malhotra, 2008). According to Davis (1989), if users find a particular technology too complex or difficult to use, they are more likely to resist incorporating it into their routines, regardless of the potential advantages it may offer. This highlights the importance of ensuring that technologies are user-friendly and intuitive to facilitate their acceptance and integration into everyday practices.

b) Perceived Usefulness

The perspective of an individual regarding the adoption of technology is shaped by how useful they perceive the technology to be. According to Davis's model, the level of perceived usefulness plays a pivotal role in determining how readily an individual

adopts added information technology. When individuals perceive a technology as beneficial or useful, they exhibit a positive inclination towards adopting it. Notably, the concept of perceived usefulness, as highlighted by Park and colleagues in (2014), directly influences individuals' behavioural intentions to adopt and maintain the use of technology. Conversely, when individuals believe that a particular technology has minimal benefits to offer, they tend to develop negative attitudes towards it. This suggests that the perceived utility of a technology plays a crucial role in influencing people's attitudes towards its acceptance.

c) Perceived Enjoyment

Past studies have shown that the importance of Perceived Enjoyment (PE) in forecasting users' willingness to utilize information technology (IT) applications within simulated settings. Users' perception becomes more positive as their sense of ease grows.

Table 2.1: The Definition of TAM's Factors Depending on Various Sources

Factor	Definition	Reference
Perceived Ease of Use (PEOU)	How users perceive the intricacy linked to the utilization of a particular technology	(Lund, 2001)
	The ease and simplicity with which a person grasps the concept are contingent upon their personal convictions	(Davis, Bagozzi, & Warshaw, 1992a)
	One's perception that managing a particular system is uncomplicated and demands minimal exertion	(Davis, 1989)
Perceived Usefulness (PU)	An individual's assessment of implementing a specific system aimed at improving the outcome of their experience	(Davis, Bagozzi, & Warshaw, 1992a)
	An individual's personal conviction that the utilization of a particular technology will enhance their work efficiency	(Park, Park, & Heo, 2018)

	The degree to which a person perceives that the utilization of a particular system will enhance their work effectiveness	(Davis, 1989, p. 320)
	The degree of confidence in a particular subject that proves advantageous for service users	(Zuniarti et al., 2021)
Perceived Enjoyment (PE)	The level of enjoyment associated with operating a computer, irrespective of its impact on performance, is referred to as the perceived pleasantness of the task	(Davis, Bagozzi, & Warshaw, 1992a)
	The satisfaction of customers pertains to their subjective experience, particularly in relation to self-service technology, encompassing the enjoyment derived from both the process and outcomes	(Lin & Hsieh, 2011)

2.1.3.2 The Impact of Perceived Ease of Use on Customer Satisfaction and Enjoyment

The Perceived Ease of Use (PEOU) was influenced by various design elements of the technology, including its ease of grasp, alignment with user expectations, and frequency of user mistakes, as previously expected. Conversely, Perceived Usefulness (PU) was not only determined by technological functionalities that enhance task efficiency, result quality, or productivity but also by another crucial aspect, notably the Perceived Ease of Use (PEOU). This suggests that users not only assess the value of a technology based on its effectiveness and quality but also heavily consider how easy it is to use the technology in question.

One of the fundamental aspects explored in various research studies within the realm of technology acceptance is the critical role that Perceived Ease of Use (PEOU) plays in shaping not only Perceived Usefulness (PU) but also impacting the intention to use and the actual application of technology. Through empirical evidence, it has been confirmed that the perceived ease of using a technology significantly influences its perceived usefulness, rather than directly determining the intentions to use or adopt modern technologies. This cause-and-effect relationship can be graphically depicted as presented in "Figure 2.2" as indicated by Davis (1989, p. 334). Furthermore, NC (1987, p. 229) has corroborated this concept by highlighting that the usability dimension of a system complements its functionality, thereby affecting how effectively

it is utilized and even determining whether it is utilized at all. This intricate relationship underscores the importance of understanding and enhancing the ease-of-use aspect in technology acceptance models, elucidating the interconnected nature of usability and functionality in driving technology utilization.

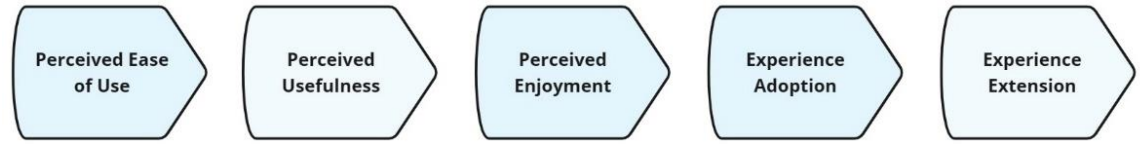

Figure 2.2: The Connection Amid Perceived ease of Use, Perceived usefulness, Perceived Enjoyment, Experience Adoption, and Experience Expansion.

Source: Author Finding

2.1.3.3 The Balancing Act of Perceived Usefulness and Enjoyment

An intriguing discovery by Vishwakarma (2020) highlights the significant impact of both factors on behavioral intentions. Their study delves into the exploration of elements affecting an individual's inclination to utilize AI technologies for assessing tourist spots. The inclination towards embracing technology is influenced by individuals' positive views on the enjoyment and advantages of artificial intelligence. Lee and colleagues (2020) also highlighted similar determinants, such as visitors' evaluations of the quality of content and their immersive experiences, which play pivotal roles in driving their desire to visit the actual destination. This suggests that the perception of AI as pleasurable or advantageous significantly impacts the adoption of technology.

In the realm of academic research, a multitude of scholars have dedicated their efforts to refining a particular model over the years. A notable example is the work of Venkatesh (2000), who meticulously investigated the factors influencing Perceived Ease of Use (PEOU), notably reshaping the conventional interpretation of Enjoyment

as a precursor to Perceived Usefulness (PU) rather than a coexisting element. In a similar vein, Venkatesh & Davis (2000) delved into the antecedents of PU while also examining the factors that moderate the relationship between PU and its precursors. Subsequently, Venkatesh et al. (2003) introduced additional variables, beyond the established PEOU, PU, and Enjoyment factors, that directly impact the inclination to adopt modern technologies. Their comprehensive analysis not only brought to light novel elements such as social influence, effort expectancy, and performance expectations but also identified moderating variables that regulate the intention to embrace modern technology and its associated precursors. These moderating factors include demographic variables like gender, age, experience, and the voluntary nature of adoption. Despite the extensive scrutiny and refinements made to the model, there exist certain unexplored territories that offer potential for further investigation in the future.

In their comprehensive analysis of the Technology Acceptance Model (TAM) literature, Marangunić and Granić (2015) have discerned four crucial focal points that warrant attention from future researchers. Firstly, they underscore the imperative need to persist in exploring the antecedents of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Secondly, they emphasize the importance of validating the presumed positive correlation between technology usage and performance. Thirdly, they stress the necessity of validating the model's applicability across a more diverse sample, including individuals from less educated or older demographic segments. Lastly, they advocate for the integration of components from alternative theories that could potentially influence the intention to adopt technology.

According to this literature, it is hypothesized that favorable consumer impressions regarding the practicality and user-friendliness of robot technology will motivate their repeat visits to a robot-operated eatery. The greater the ease with which consumers can engage with a service robot, the higher the perceived level of its benefits. This relationship highlights the importance of user-friendly interactions in shaping positive perceptions towards automated service providers.

2.1.3.4 Experience Satisfaction and Extension

a) Experience Satisfaction

Customer satisfaction can be defined as the culmination of actions that customers undertake, primarily influenced by their self-evaluation and emotional responses resulting from direct personal interactions with a product, service, or brand. In a similar vein, according to Hellier (2003), customer satisfaction is linked to customers' service expectations and the desire for these expectations to be met, alongside the enjoyment and satisfaction derived from the service delivery process, which goes beyond meeting expectations and results in a positive experience.

b) Experience Extension

Experience extension refers to customers expressing the emotional or mental benefits of an experience to their peers (Dong & Siu, 2013). Customers tend to share and prolong experiences when their expectations are met satisfactorily (El-Said, Smith, & Al Ghafri, 2021). The integration of automated service technology in fast-food establishments allows patrons to place orders, complete payments, and receive their meals without interacting with any staff members. In-depth inquisitions into the phenomenon of experience extension uncover the intricate process whereby customers communicate the emotional or mental value of an experience to their social circles.

Providing this level of convenience can influence customers, enhancing their overall service encounter. Misusing self-service, especially in cases where a machine malfunctions, can diminish the service quality, resulting in decreased customer willingness to utilize it again (Furtado et al., 2020).

c) Connection Exploring Experience Satisfaction and Extension Experiences

In the research conducted by Fornell in (1992), a strong correlation was identified between customer satisfaction and the establishment of a positive reputation for a business. Contented customers exhibit a tendency to show preference towards the service provider and often recommend it to others based on their positive interactions. This indicates that individuals who express satisfaction with self-service technology

are more likely to communicate positive feedback to their peers, highlighting the impact of customer satisfaction on generating positive word-of-mouth referrals.

2.1.4 Human-Robot Interaction

In the contemporary digital environment, the dynamics of communication between consumers and service providers are poised for noteworthy shifts. The utilization of innovative technological frameworks within the customer-facing operations of service providers is acknowledged as a pivotal element in enhancing service interactions (Van Doorn et al., 2017). This assimilation of technology empowers service providers to interact with clients in a more efficient and influential manner, thereby fostering the development of relationships between service personnel or automated systems and customers (Marinova et al., 2017).

It is crucial to ascertain if customers' experiences vary depending on the type of robot application models, especially in the current experience-driven economy. Customers nowadays yearn for service encounters that are memorable, incorporating immersive aesthetics along with entertaining and educational elements (Lai, Liu, & Lu, 2021; Maital, 1999; Zhang et al., 2021). In addition, considering the emergence of robots in the service sector as a groundbreaking development, dining at a robotic restaurant could serve as a remarkable platform to showcase state-of-the-art technologies to customers. Within the contemporary landscape of socially conscious enterprises, we advocate for robotic eateries to not only offer distinctive dining experiences but also to educate patrons about the latest advancements in robotics, thereby facilitating their seamless integration with technology. By embracing the concept of robotic restaurants, customers can not only enjoy novel dining experiences but also gain exposure to innovative technological innovations, encouraging them to embrace and engage with technology in a more familiar and comfortable manner.

The concept of social presence involves how people interact socially with robots as if they were living beings by mentally simulating non-human intelligence (Tung & Law, 2017). This phenomenon, as highlighted by Tung & Law (2017), acts as a link between humans and robots, influencing an individual's intentional, cognitive, and emotional responses. Social presence plays a crucial role in deciphering the underlying mechanisms of functional and emotional engagement in human-robot interactions,

emphasizing the significance of measuring it (Lee, Park, & Song, 2005). Understanding users' interactions with social robots and their future technology acceptance is heavily reliant on social presence, as indicated by Shin & Choo (2011). The study conducted by Murphy and colleagues in (2019) delved into the incorporation of human-like attributes into robotic aides as a strategy to augment their communication skills. By infusing these qualities into service robots, they aimed to bolster the efficiency and effectiveness of human-robot interactions significantly.

Variations in the impact of social presence are influenced by individuals' age and educational background. According to Heerink (2010), the inclination to utilize robot aides declines with advancing age. Moreover, the perception of socially interactive robots is linked to educational attainment, showing a rise with higher levels of education. This factor becomes crucial in hospitality environments to grasp the way social presence impacts the acceptance of robot assistants.

The significance of rapport in service encounters has been underscored as a key element that influences customers' favourable reactions to service providers (Chang et al., 2020; Hwang & Lee, 2019; Kim, Ok, & Gwinner, 2010). Establishing a strong rapport between customers and employees can enhance customers' loyalty to the organization, foster positive perceptions of the service provider, elicit emotional connections, and increase the likelihood of repeat business (Choi & Jo, 2021; Hyun & Kim, 2012). The rapid pace of advancements in artificial intelligence (AI) technology is undeniably shaping the landscape of various industries. However, experts specializing in the service sector emphasize that the successful integration of AI into customer service operations heavily relies on the acceptance and embrace of this technology by customers (Belanche et al., 2020; Gursoy et al., 2019; Lu, Cai, & Gursoy, 2019). Numerous research studies have delved into the multifaceted aspects surrounding the adoption and acceptance of AI in enhancing customer service experiences.

When considering human-robot interaction, the physical design of a robot significantly influences users' perceptions. The widely recognized Uncanny Valley theory (2012) posits that the resemblance of a robot to a human directly impacts the level of comfort individuals experience in its presence. It is noted that users may not always respond positively when a robot closely mimics human features; even minor deviations from perfect resemblance can create a sense of unease in individuals. This theory delves into

the nuanced relationship between human likeness in robots and the psychological responses it triggers in users, emphasizing the importance of balancing realism and artificiality in robot design to ensure a positive user experience. The Uncanny Valley theory elucidates the intricate dynamics at play in human-robot interactions, highlighting the delicate balance required to avoid unsettling users due to overly human-like robot features. People view robotic entities as a blend of different physical forms within a functional setting, which impacts their perceived abilities (Li J. , 2015).

Conducted an in-depth analysis focusing on visitors' attitudes towards the inclusion of social robots in service environments and closely examined the dynamics of interactions between humans and robots. The research findings highlighted a significant linkage between the perceived value associated with utilizing the robot and its subsequent impact on perceived usefulness, ease of use, service reliability, personal engagement, and tangible attributes. Additionally, the study emphasized the crucial roles of empathy and information exchange in molding the interactions between humans and robots, thereby shaping visitors' willingness to engage with such technologies. Similarly, Gursoy et al. (2019) delved into exploring consumers' preparedness to accept and integrate artificial intelligence tools within service-related contexts in a formal and explanatory tone.

Recent studies have shown that the integration of cutting-edge technology has the potential to significantly elevate user satisfaction, engagement, and overall gratification, as highlighted by Kim and Morosan (2006). While initial research primarily focused on the practical utility of technology for task performance and user adoption decision-making, it is now acknowledged that the realm of enjoyment encompasses more than just utilitarian aspects. This recognition has shed light on the intricate relationship between pleasure-driven motivation and user intent, as emphasized by Shin and Choo (2011). In the context of robotic services, scholars have observed a notable trend where individuals derive amusement and pleasure from their interactions with service robots. These positive experiences not only foster a sense of delight but also shape individuals' future behaviours, as noted by Wood et al. (2013). Lee & Sabanović (2014) further proposed that the human-like interface of robots has the ability to evoke pleasurable emotions such as fun, enjoyment, and curiosity among users. This emotional response leads customers to embrace the adoption of robotic assistant technologies in their daily interactions, as outlined by Zalama et

al. (2014). The humanoid design of robots serves as a prime example of how these technological assistants can provide enriching and fulfilling experiences for users, shaping their interactions in meaningful ways.

Clients opine that a delightful robotic dining establishment could create favourable memories, subsequently enhancing service standards. Therefore, it is advisable to analyse the entertainment aspect of robot-operated eateries and evaluate customer attitudes, an area necessitating further study despite the rising acceptance of robots in the restaurant industry (Hwang, Park, & Kim, 2020).

2.1.4.1 Customers' Satisfaction

Customer satisfaction holds paramount importance as a pivotal metric that evaluates the past, present, and future performance of an organization. It has perennially remained a key focal point for professionals in the marketing domain and researchers alike. Within the sphere of satisfaction, there are two fundamental concepts that are widely deliberated: specific exchange satisfaction and overall satisfaction (Ha & Jang, 2010). Specific exchange satisfaction denotes a customer's immediate sentiments towards a particular product or service. Conversely, overall satisfaction encapsulates a customer's holistic experience with a product or service, exerting a substantial influence on post-purchase behaviours such as shifts in attitude, recurring purchases, and the cultivation of brand loyalty (Namkung & Jang, 2007). In essence, customer satisfaction not only reflects the customer's contentment with a specific transaction but also mirrors their broader satisfaction with the overall product or service.

2.1.4.2 Behavioral Intentions

Customer satisfaction and behavioural intentions, although separate entities, share a vital connection, with satisfaction playing a significant role in influencing a customer's choice of service provider (Han, Hsu, & Lee, 2009). Behavioural intention pertains to an individual's mental constructs concerning their planned actions in a specific scenario. Initially regarded as a surrogate for actual behaviour by certain scholars, the theory of planned behaviour establishes a close link between the intention to engage in an action and the action itself, particularly in instances of voluntary behaviours (Ryu, Lee, & Kim, 2012). Delving deeper into these concepts, it becomes evident that

the level of satisfaction experienced by a customer can greatly impact their decision-making process when selecting a service provider. Customers tend to assess their satisfaction levels with a particular service before forming intentions to engage further with the provider.

2.1.5 Product Level Theory

The integration of robotic technologies in hospitality services has transformed the customer experience significantly, involving the utilization of robots across different stages of service provision and delivery, as discussed by Seyitoğlu & Ivanov (2020) and Kazandzhieva & Filipova (2019). Referring to the Product Level Theory, a fundamental concept in product design, restaurants are presented as offering a blend of tangible products and intangible service encounters to meet customer needs. Oh et al. (2007) exemplifies educational experiences for customers, such as themed guestrooms in a B&B or interactive cooking demonstrations, emphasizing active participation and engagement to enhance the educational aspect, as highlighted by Maital (1999).

Given the knowledgeable audience, the formal nature, general domain, and the intent to inform, the results are as follow: --- The utilization of robots in customer service offers a distinctive and innovative experience, potentially leading customers to form favorable perceptions of robots on fundamental, facilitating, and augmented levels. At the core product level, essential customer needs like hunger satisfaction in restaurants are met through items such as food and beverages (Reid & Bohanic, 2009). For instance, preparing food in a visible kitchen falls under core product offerings. Facilitating and supporting products, essential for core product utilization, encompasses tasks like welcoming guests, assigning tables, taking orders, serving meals, and handling payments in the dining sector. In the augmented product dimension, factors like customer interactions, server dynamics, and the dining ambiance play a pivotal role (Kotler, Bowen, Makens, & Baloglu, 2017). These aspects serve to differentiate one service provider from another, with robotic restaurants incorporating entertainment via service robots to enhance customer experiences. Building upon existing models, researchers have explored the application of product levels and the experience economy model in the context of robotic dining

establishments. However, the diversity in customer experiences at robot-operated eateries based on their educational backgrounds underscores a research gap concerning the design and implementation of service robots in hospitality settings (Ma et al., 2021).

The choice of integrating service robots across various product/service tiers versus limited deployment has substantial cost implications. This dilemma is observable in real-world scenarios where the majority of robotic restaurants blend human and robotic resources instead of being entirely automated. Nonetheless, the impact of varying service robot deployment models on enhancing customer satisfaction lacks conclusive evidence.

While there exists a substantial theoretical correlation between this concept and the realm of robotic services, practical endeavors in this field are infrequent. Moreover, there is a scarcity of information accessible to restaurateurs to aid them in determining the optimal product and service standards suitable for robotic assistance while discerning tasks more effectively handled by human personnel.

2.1.6 Human-Employee Versus Robot Employee

Numerous research findings indicate that individuals tend to decrease their level of effort when they perceive their competitors as outperforming them. At the 14th ACM/IEEE International Conference on Human-Robot Interaction in (2019), a study conducted by scholars from Aix-Marseille University shed light on the neurobiological response elicited through human-robot collaboration.

Researchers found that the brain region responsible for processing social rewards shows reduced activity when interacting with machines compared to human interaction. Through brain imaging of participants, distinct variations were observed in key brain regions such as the amygdalae, basal ganglia, and hypothalamus, with heightened activation during human communication and decreased activation during robot interaction.

It may seem counterintuitive, but there is a notion that the flawless nature of robots hinders our ability to establish emotional connections with them as colleagues. Research conducted at the University of Lincoln revealed that when robots were

imbued with human-like imperfections and quirks, individuals found it easier to connect with them on an emotional level.

The notion of suggesting that the flawlessness of robots hinders the establishment of emotional connections with our robotic counterparts may seem unconventional. Research conducted by the University of Lincoln in (2014) indicated that incorporating human-like imperfections in robot design resulted in volunteers forming stronger emotional bonds with them. This raises the question of whether humans are capable of forming emotional attachments with robots. Studies by Suzuki in (2015) suggest that people can indeed experience feelings of compassion and empathy towards robots.

Currently, we are in the initial phases of exploring the dynamics between humans and machines, making recent discoveries in this area both innovative and stimulating. As the collaboration between humans and machines intensifies, it becomes imperative to deepen our comprehension of their interactions. While significant effort has been directed towards fostering effective teamwork among human colleagues, there is now a pressing need to invest similar resources in facilitating seamless cooperation between humans and machines.

2.2 Hypothesis Development

The primary focus of this research lies in the significance of customer intention in relation to how they select a restaurant, which subsequently influences their reviews and ratings. To investigate these connections, a series of hypotheses were formulated to analyse the impact of customer and/or employees' satisfaction, considering various moderating factors such as proficiency and quality.

Building upon Davis’s Technology Acceptance Model (1992a), we have adapted and enhanced it to assess the satisfaction and expansion of customer experiences in automated eateries. Our proposition emphasizes the significance of perceived ease of use (PEOU), perceived usefulness (PU), and perceived enjoyment (PE) as crucial determinants of customers' attitudes towards engaging with service robots, thereby impacting their inclination to adopt. Apart from integrating experience satisfaction, acceptance, and extension as distinct variables, we have incorporated demographic distinctions and varying product tiers as moderating elements.

2.2.1 The Influence of Perceived Ease of Use on Enjoyment and usefulness

Davis emphasizes that the ease of interacting with a system should not be merely seen as a predictor of individuals' attitudes towards the technology, but rather as a forecaster of both perceived usefulness (PU) and perceived enjoyment (PE). This viewpoint has been supported by previous research in the field of robotic services, as indicated by studies by Lee, Lin, & Shih (2018) and Park & Pobil (2013). A case in point is the exploration of customer perceptions regarding robot-assisted services in Korean restaurants, revealing a measurable influence of ease of use on both PU and PE, as demonstrated by Seo & Lee (2021). The current study postulates that the ease of system usage will have a favourable impact on the perceived usefulness and enjoyment experienced by customers at robot-operated eateries in Istanbul.

Hypothesis 1a: The belief that a system is easy to use is directly linked to the belief that the same system is useful.

Hypothesis 1b: The belief that a system is easy to use is directly linked to the belief that the same system is enjoyable.

2.2.2 Factors Influencing Experiential Satisfaction: Perceived Usefulness, Usability, and Enjoyment

Incorporating insights from current research within the hospitality industry that apply the Technology Acceptance Model (TAM) to examine automated services, we aim to delve into the concept of Perceived Ease of Use (PEOU). Perceived Ease of Use refers to an individual's subjective evaluation of the complexity associated with interacting with a service robot. Our comprehensive analysis explores the intricate relationship between user perceptions and the functional aspects of these automated systems (Abou-Shouk, Gad, & Abdelhakim, 2021; Hwang, Park, & Kim, 2020). The concept of experiential novelty pertains to a customer's emotions post-experiencing something innovative and distinctive (Salem et al., 2021). Synonyms for novelty encompass inquisitiveness, exploration, innovation, and distinctiveness (Crompton, 1979). Scholars have underscored that experiential novelty serves as a key driver for exploring new destinations and engaging with cutting-edge technologies. In the domain of hospitality, the incorporation of robotic services has been associated with heightened levels of guest contentment. This phenomenon is primarily driven by the

novelty and user-friendliness inherent in this technological advancement as highlighted by Qiu and colleagues in (2020).

Hypothesis 2a: Perceived ease of use has a positive impact on experience satisfaction.

In-depth investigation into past studies focusing on automated services in the hospitality industry has uncovered a crucial finding that the perceived usefulness (PU) plays a pivotal role in how patrons evaluate their service experiences. Specifically, research suggests that in Istanbul's robot-operated dining establishments, where robots exhibit exceptional proficiency and efficiency in task execution, customer satisfaction is likely to be positively influenced by the degree of usefulness perceived in these services. Building upon contemporary literature within the hospitality sector that applies the Technology Acceptance Model (TAM) to assess robotic services, PU is defined as individuals' perception of the value offered by the service provided by robotic assistants (Abou-Shouk, Gad, & Abdelhakim, 2021; Hwang, Park, & Kim, 2020). This thorough examination delves into the intricate interplay between customer satisfaction, perceived usefulness, and robotic service efficiency, highlighting the significance of understanding how customers perceive and interact with automation in the service industry, particularly in a bustling metropolis like Istanbul.

Hypothesis 2b: Perceived usefulness has a positive impact on experience satisfaction.

Perceived enjoyment (PE) denotes the degree of satisfaction attained from a specific technology, regardless of its functionality, as indicated by Davis, Bagozzi, and Warshaw in (1992a). Extensive research has consistently highlighted the pivotal role of PE in shaping consumer acceptance of cutting-edge technologies across diverse sectors. Notably, recent studies, such as the one by Hwang and colleagues in (2020), have underscored the significant impact of PE on consumer attitudes towards robotic services, emphasizing the consumer's pleasurable inclination towards innovation as a key driver. This underscores the crucial influence of consumers' pleasure-driven engagement with technology on their perceptions and acceptance of emerging technological solutions.

Hypothesis 2c: Perceived enjoyment has a positive impact on experience satisfaction.

2.2.3 Congruency between different demographic segmentations and Experience Acceptance

The current research delves into consumer reactions to service robots, with a specific focus on the diner type factor, whether diners are alone or with companions in restaurants. This research endeavours to bridge the existing gap in academic literature by delving into the impact of automated services on consumer perceptions within the restaurant industry, specifically focusing on how these services influence attitudes towards the dining establishment and the likelihood of customers revisiting, all within the context of different social settings experienced by diners. While prior studies have shed light on the competitive advantage presented by humanoid service robots due to their perception as "social entities" (Lu, Zhang, & Zhang, 2021; Qiu et al., 2020; Van Doorn et al., 2017).

Previous studies indicate that individuals dining alone tend to feel more uneasy around others compared to those dining in groups at restaurants (Her & Seo, 2018; Hwang, Shin, & Mattila, 2018). Our hypothesis focuses on the assumption that solo diners will express positive opinions about the restaurant and show interest in visiting establishments with service robots.

Hypothesis 3a: The acceptance level of AI-assisted robotic services differs among various customer diner types.

Morris & Venkatesh (2000) discovered a significant correlation between the attitudes of youth and their inclination to adopt technology, as opposed to the older demographic. Older individuals typically have limited exposure and familiarity with innovative technologies, resulting in a lower propensity to engage with them. This reluctance stems from challenges in comprehending and operating such devices, alongside a decrease in confidence in utilizing self-service technology as they age (Dean, 2008).

Hypothesis 3b: The acceptance level of AI-assisted robotic services differs among various customer age groups.

Hypothesis 3c: The acceptance level of AI-assisted robotic services differs among various customer educational qualifications.

Based on the study conducted by Lee and Yang in (2013), findings revealed that women tend to experience elevated levels of anxiety in contrast to men when interacting with technology, leading to a decreased perception of control and self-assurance particularly in the context of using self-service interfaces. The research indicated a noticeable discrepancy in the comfort and confidence levels between genders.

Hypothesis 3d: The acceptance level of AI-assisted robotic services differs among various customer gender demographics.

2.2.4 Examining How Robotic Implementations Affect User Satisfaction across Different Product/Service Tiers

Utilizing robots in restaurants goes beyond just delivering food; they can also serve as hosts and entertainers, elevating service standards significantly (Seyitoğlu & Ivanov, 2020). By embodying innovative technology, robots can enrich customers' dining experiences by assuming various roles like chefs, servers, and entertainers (Go, Kang, & Suh, 2020). Hence, the presence of robots in hospitality establishments contributes to a distinctive and enjoyable entertainment experience, encompassing cooking demonstrations (core level), hosting, delivery services (facilitating level), and customer interaction (augmented level) in robot-themed diners.

Drawing from a thorough review of existing literature, we put forward and substantiated our conjectures regarding the potential impact of utilizing robots across various product/service tiers on the educational and entertainment experiences of customers.

Hypothesis 4a: Incorporating robotic technology at the core level of a service will impact customer experience acceptance level positively.

Hypothesis 4b: Incorporating robotic technology at the facilitating level of a service will impact customer experience acceptance level positively.

Hypothesis 4c: Incorporating robotic technology at the augmented level of a service will impact customer experience acceptance level positively.

2.2.5 The Expansion of Customer Experience

Experience extension, as defined by Dong and Siu in (2013, p. 544), involves visitors actively sharing the emotional and intellectual rewards they have gained from their experiences with others in their social circles. Research conducted by El-Said, Smith, and Al Ghafri in (2021) suggests that customers are more likely to communicate and prolong their experiences if their initial expectations are met. This phenomenon highlights the importance of meeting customer expectations as it influences their propensity to engage in word-of-mouth marketing and extend the impact of their experiences to others in their networks. Moreover, the more enjoyable an experience is, the higher the likelihood that individuals will share and enhance it with others. Therefore, in Hypothesis 2c, it is posited that Positive Emotions (PE) positively influences customers' experiences, prompting a new hypothesis concerning the correlation between satisfaction with the experience and its extension.

Hypothesis 5: Being satisfied drives experience expansion.

2.2.6 Human Employees Intension and Attitude Toward Robot Employees

When considering the interaction between human workers and robots and the emotional aspect humans associate with robots, a perspective asserts that despite the increasing significance of robots, the value and relevance of humans will persist. It is argued that individuals, with traits like empathy, adaptability, and emotional understanding, are uniquely equipped to manage the subtle nuances necessary for optimal outcomes. Hence, humans will continue to hold a vital position in delivering quality customer service. While automation offers advantages, it can never fully supplant human involvement.

The other view stated that with the advancement of technology and reliance on robots in several areas of service, the presence of the humanitarian factor will disappear little by little. But so far, no research has investigated the viewpoint and opinion of human workers about collaborating with robots, weather they have a positive or negative attitude and reaction toward the other side.

Hypothesis 6: The AI-supported automated restaurant services human-employees have a positive reaction toward robot-employees.

2.2.7 Embracing the Technology by Owners

Scholars investigating robotics and artificial intelligence applications in hotel settings found that precision in information, streamlined operations, and the ability to communicate in multiple languages significantly influenced the acceptance and utilization of these technologies. Likewise, the use of robotic services in dining establishments presents a wide array of potential advantages such as improved operational effectiveness, enhanced efficiency, and increased productivity as highlighted by Park and Pobil's research in (2013).

Automation excels in task efficiency compared to individuals. Consequently, in dining establishments, this capability translates to notable drops in order waiting periods, potentially resulting in heightened patron contentment (Wirtz et al., 2018). In addition, it is of paramount importance to emphasize that restaurants utilizing robotic assistance have the capacity to reallocate human resources to more complex and demanding tasks. A study carried out in Türkiye by Vatan and Dogan in (2021) provides insight into how the efficient distribution of tasks between robots and human workers can reduce service times and enhance the overall operational efficiency.

This study suggests that the perception of satisfaction by both customers and employees plays a crucial role in improving operational efficiency and reducing labour costs. As a result, business proprietors are prompted to explore the integration of appropriate robotics technologies to optimize their business processes.

Hypothesis 7: The adoption of robotic services in restaurants leads to improved operational efficiency and reduced labour costs.

2.3 Proposed Conceptual Model and Key Variables

Drawing upon the Technology Acceptance Model (TAM) in our study, we have extensively explored its application to evaluate customer and staff satisfaction and overall experience within robotic service restaurants. Within this framework, we have meticulously maintained and delved into the fundamental components: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and Perceived Enjoyment (PE) as distinct variables, alongside considerations of customer characteristics and the quality of products and services offered. This in-depth analysis not only scrutinizes the interplay of these factors but also emphasizes their role in shaping the perceptions and

interactions of both customers and staff members in the context of technologically driven dining establishments. The study treats satisfaction and extension of experience as dependent variables. Through our analysis, we have examined how TAM variables, various customer traits, and the integration of robots across different product/service tiers impact satisfaction and extension of experience.

In light of the discussion, a detailed conceptual framework highlighting the envisioned linkages is graphically represented in Figure 2.3.

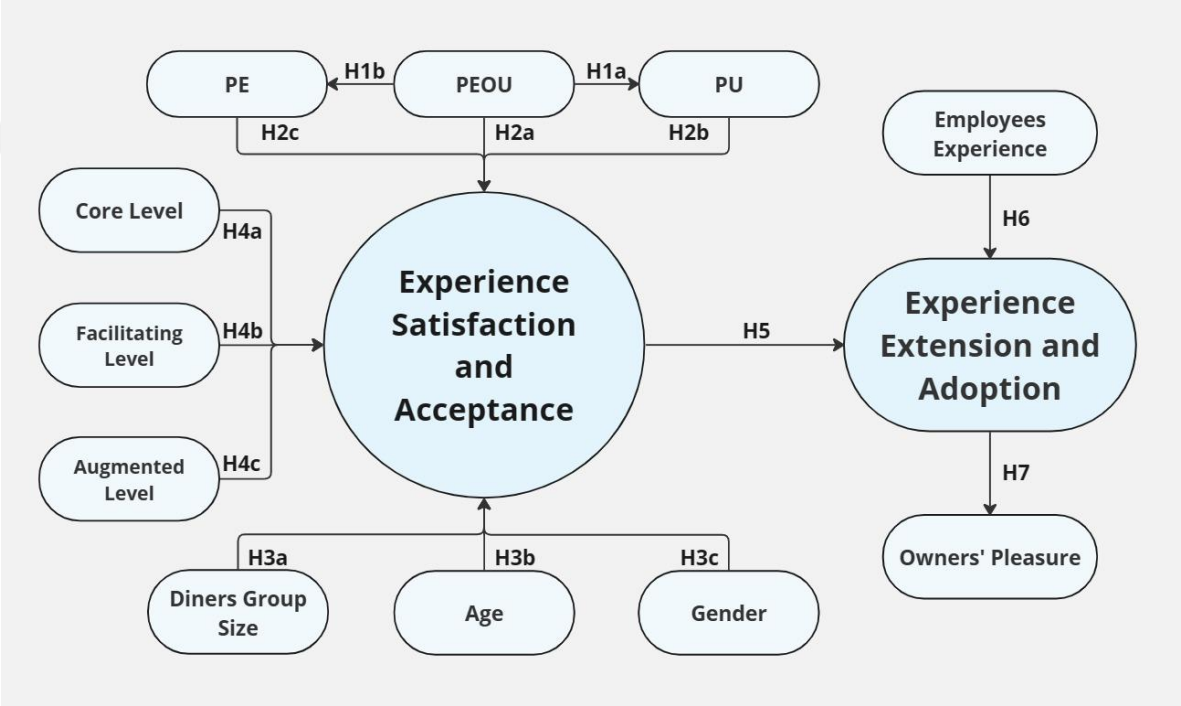

Figure 2.3: The Study's Theoretical Structure

Source: Author Finding

CHAPTER III

METHODOLOGY

3.1 Introduction

The methodology section is a key highlight within the study, increasingly valuable for scrutinizing the completed process and its effectiveness. According to Silverman (2020), research methodology is a precise and methodical approach for gathering information on a specific subject. Synder (2019) also emphasizes that the methodology chapter enhances the understanding of high-quality data interpretation. Consequently, this chapter equips readers with the tools to evaluate and probe into the accuracy and credibility of ongoing research. Emphasizing the chosen method, this segment delves deeply into the research approach with additional insights into the study's research design.

In thorough contemplation, the research design and methodology selected have been meticulously scrutinized, underpinned by a comprehensive justification for their choice. Furthermore, the section expounded on the methodology utilized for data acquisition. The principal aim of this research endeavour is to delve into the influence of AI-backed robotic services in dining establishments in Istanbul on not only customer contentment but also the working experiences of employees. This investigation entails a detailed exploration of how the integration of artificial intelligence in the restaurant sector impacts various stakeholders, as well as the underlying mechanisms that drive changes in customer satisfaction levels and employee perceptions. Consequently, this chapter delves into the specifics of data collection procedures, sampling methods, and sample size. Moreover, a comprehensive overview of the data analysis tool utilized is provided. In this chapter, thorough discussions are dedicated to the ethical principles that have been followed during the data collection and research procedures, alongside a detailed exploration of the limitations identified within the study.

3.2 Research Philosophy

The concept of research philosophy refers to the underlying belief system that shapes the process of gathering data on a particular subject. Caldwell (2015) categorizes research philosophy into pragmatism, realism, interpretivism, and positivism. According to Marsonet (2019) positivism is beneficial for research reliant on scientific methodology, proposing an objective understanding of the social realm. Caldwell (1984) emphasizes that the choice of philosophy is dependent on the research issue and is pivotal in assessing, gauging, and defining research components while providing a rationale for issue identification. This philosophy is rooted in observable facts, as noted by Marsonet (2019), leading to statistical scrutiny. However, since the current study aims to analyse both qualitative and quantitative results, this particular philosophy is deemed inadequate.

Realism, a prominent philosophy frequently applied in research, is grounded in scientific assumptions that hold a pivotal position in the progression of knowledge. Realism emphasizes the belief that the external world exists independently of our cognition and observation. Vveinhardt (2018) emphasizes that realists increasingly draw upon interpretive and positivist philosophical principles. This philosophy underscores the importance of observing subjective phenomena, only accepting concepts that motivate action. Conversely, in pragmatism philosophy, as highlighted by Shusterman (1997), the focus is on framing the research question as a pivotal element. The study contends that pragmatism synthesizes positivism and interpretivism philosophies. Bacon (2012) discovered that pragmatism considers both empirical evidence and consequences. On the other hand, interpretivism, another notable philosophy, enables researchers to analyse and comprehend specific study aspects. This philosophy heavily critiques positivism regarding social aspects. Nonetheless, the constraints of interpretivism prevent its application in current research design due to its incompatibility with quantifiable data interpretation.

The current research utilizes the philosophy of pragmatism to achieve its goals. Pragmatism is considered a blend of interpretivism and positivism philosophies. Positivism assists in analysing measurable outcomes, while interpretivism aids in assessing and explaining qualitative data. Žukauskas et al. (2018) emphasize the pivotal role of pragmatism in producing both quantitative and qualitative research results. This philosophy is instrumental in examining various research aspects, such as

the influence of artificial intelligence on future employment trends and evaluating this impact using quantifiable metrics. Pragmatism is crucial for generalizing and interpreting research findings.

3.3 Research Approach

The research strategy is commonly viewed as a general technique that assists researchers in articulating their viewpoints. There are two primary research methodologies: inductive and deductive, each with unique characteristics. Deductive research is typically seen as a top-down approach, while inductive research is about exploring theories and arguments that align with the subject matter. Inductive methodologies help researchers identify vital elements in the research context. Gregory and Muntermann (2011) employed deductive techniques to scrutinize established theories, evaluating them against specific phenomena.

The study revealed the growing importance of the deductive method in gathering insights and formulating hypotheses for a specific context. The current study has utilized this approach to evaluate hypotheses. Four potential hypotheses were identified in this study. The initial hypothesis postulates a favourable correlation between the perceived ease of use, perceived usefulness, and enjoyment. In contrast, the subsequent set of hypotheses delves into the beneficial influence exerted by perceived ease of use, perceived usefulness, and perceived enjoyment on experience satisfaction. Moreover, the third hypothesis scrutinizes the varying degrees of acceptance of AI-supported robotic services among distinct customer demographic segments. Lastly, the fourth hypothesis assesses the impact of robotic applications on experience satisfaction at various levels of product/service offerings, encompassing an in-depth exploration of these dynamics. Expanding further on the hypotheses outlined, the interplay between perceived ease of use, perceived usefulness, and enjoyment is identified as a critical factor shaping the user experience. This framework underscores the intricate relationship between these elements and their collective impact on customer satisfaction.

In addition, the fifth, sixth, and seventh hypotheses have the objective of investigating the interconnections between customer satisfaction derived from experience, the extension of the experience, the human-employee experience, and the enhancement of

operational efficiency. The deductive methodology employed in this research holds considerable importance by enabling deductive reasoning through quantitative analysis. This approach has played a vital role in statistically assessing both the data and hypotheses.

Okoli (2023) discovered that deductive reasoning is valuable for researchers utilizing objective ontology and positivist epistemology. Quantitative tools play a significant role in deductive reasoning during the research phase, aiding in the evaluation of individual experiences. In contrast, the inductive approach prompts researchers to base their reasoning on the research process, particularly when formulating theories without assessing models. Smart et al. (2012) observe that the research journey typically commences with documenting and reflecting on specific experiences. Azungah (2018) also notes that inductive reasoning often commences by generalizing themes and patterns. As a result of the necessity for hypothesis testing and experiential evidence in the current research, a deductive method has been employed.

Deductive reasoning, as underscored by Liu (2016), is widely recognized as the logical approach to evaluating and examining results derived from theoretical frameworks. This methodical process involves drawing specific conclusions based on general principles or theories. The rationale behind employing this method lies in its perceived importance and efficiency in drawing logical inferences. Thus, the present research adopted a deductive strategy to meticulously gather data and assess the implications of introducing robotic services in restaurant settings.

3.4 Research Design

Edmonds and Kennedy (2016) introduced a framework suggesting that in research, there are three primary design types, each with a unique role: mixed methods, quantitative, and qualitative. Quantitative research design specifically revolves around the use of numerical data, emphasizing proportions and evaluations to enable unbiased and methodical analysis. This type of research design is focused on gathering data in the form of numbers, enabling researchers to quantify observations and derive statistical patterns. Vogt et al. (2014) demonstrated that quantitative data minimizes personal bias, contributing to the effectiveness of research frameworks. On the

contrary, qualitative research design prioritizes subjective data collection within its methodology.

In their research conducted in (2016), Edmonds and Kennedy explored the collection of qualitative data using diverse methodologies, including structured discussions, deliberations, presentations, written content, visuals, and dialogues. Additionally, Vogt et al. (2014) emphasized a significant advantage associated with the utilization of this approach, which lies in its capacity to facilitate comprehensive examinations of individuals' experiences, viewpoints, and subjective feelings. This methodology allows for a nuanced understanding of the intricacies of human experiences, providing researchers with the tools to delve deeply into the complexities of human behaviour and emotions. Moreover, the mentioned research argues that despite its in-depth insights, the qualitative research approach is heavily scrutinized due to its susceptibility to individual biases. Consequently, due to its subjective nature, achieving definitive and unambiguous outcomes proves challenging.

The mixed-method design, as the third research approach, proves to be a highly effective option across various fields. According to Schoonenboom and Johnson (2017), this design involves merging both qualitative and quantitative research methodologies. By utilizing this approach, researchers aim to gather a comprehensive set of data types, thereby strengthening the validity of their findings through triangulation. In line with the observations of Edmonds and Kennedy (2016), the results obtained through mixed-method research are deemed robust and dependable in comparison to alternative methodologies. The integration of a mixed-method design not only enables researchers to effectively surmount internal research constraints but also enhances the robustness of their studies. In the unique context of the current research endeavour, the adoption of a mixed methodological approach was deemed highly appropriate. As elucidated in the scholarly work by Vogt et al. (2014), one of the significant advantages of this methodology lies in its capacity to present research outcomes through both numerical data and narrative descriptions. Consequently, the study meticulously implemented a mixed research methodology to evaluate the impact of AI-supported robots in restaurants located in Istanbul on both customer satisfaction levels and the experiences of employees. By amalgamating quantitative metrics with qualitative insights, the study not only quantified the effects of robots on customer satisfaction but also delved into the nuanced perspectives and viewpoints of restaurant

staff members, thereby offering a comprehensive analysis of the multifaceted impacts of artificial intelligence in the hospitality industry.

The research will employ a combination of methods involving questionnaire and interviews. Data will be collected from customers of automated eateries through questionnaire, while employees will participate in brief interviews. A statistical power analysis will determine the required sample size to ensure the study's validity. Participants will consist of customers and employees from restaurants offering robotic services. The selection process will involve purposive sampling to identify suitable establishments and random sampling to choose participants. The sample will encompass customers who have visited robotic restaurants and can recall their experiences, as well as employees who have interacted with robotic systems.

3.5 Data Collection & Sampling

The research methodology employed in this study comprises three main components. Initially, a quantitative approach was adopted through a questionnaire targeting customers. In the subsequent phase, valuable qualitative perspectives were obtained through in-person interviews held with human staff members. Before commencing the data collection process, it is noteworthy that the Research Ethics Committee at Istanbul Sabahattin Zaim University in Türkiye diligently verified compliance with all ethical protocols, thereby facilitating the acquisition of crucial ethical approvals. These meticulous procedures underscore the institution's unwavering commitment to upholding ethical standards and ensuring the integrity of the research process in the context of human subjects. The research project meticulously accounted for various ethical aspects, including volunteers being notified about the voluntary nature of their participation, the exclusive research-oriented use of collected data, and the strict confidentiality of their personal details. Certainly, before initiating the questionnaire, participants were furnished with comprehensive and intricate details concerning the aims and context of the study.

3.5.1. Questionnaire

A questionnaire has been structured to gather information regarding the satisfaction of customers. The questionnaire, utilizing both physical and online methods for data

collection, is aimed at patrons of restaurants leveraging service robots. The questionnaire, developed in English language, comprises an introduction and five sections. The initial section assesses the eligibility of respondents based on their interaction with robotic restaurants. Subsequent sections delve into demographic details, Technology Acceptance Model variables, Product Level Theory, and the extension of user experience.

An online questionnaire was circulated for responses from February 28th until the conclusion of April 2024, garnering a total of 170 replies. Nonetheless, fourteen incomplete responses were excluded, resulting in the inclusion of 156 fully completed questionnaires. The distribution of the questionnaire link was strategically planned and executed through diverse social media platforms including Twitter, Instagram, and WhatsApp. This meticulous approach aimed to ensure a broad spectrum of demographic groups would contribute to the data collection process, thereby enhancing the representativeness of the gathered data.

In order to enhance the introduction to the questionnaire, Appendix-A provides a comprehensive compilation of all the questionnaire questions accompanied by their corresponding responses in the Appendix-A: QUESTIONNAIRE

3.5.1.1 Introduction

As an introductory, the respondents will encounter a greeting and tribute first. Then some details about the questionnaire are mentioned.

3.5.1.2 Opening Question

In this segment, respondents are required to respond to a pair of inquiries related to their past encounters with service automatons, if such encounters exist. Respondents opting for the former were permitted to take part in the research study if they acknowledged visiting eateries utilizing robots for service delivery. Conversely, those indicating they had not patronized a robotic restaurant were excluded from questionnaire participation.

3.5.1.3 Demographics

Within this segment, inquiries encompassed the demographic details of the participants, including but not limited to gender, age, educational background, income level, and dining preferences.

3.5.1.4 Product Level Theory

Within this segment, attendees were prompted to envision being in possession of a voucher permitting them to partake in the opportunity of patronizing one of three distinct eateries overseen by robotic service staff at distinct phases.

The first option is for a classic restaurant, it gives you the opportunity for a distinct experience, as the robot is the one who prepares the food and cooks (core service). The second restaurant option is for a one that implementing robot in food delivery, in addition to the smart service that manages ordering and payment, that is done using smart screens (facilitating service). The last option, a restaurant that employs robots that make an interaction between customers, robots themselves, and the dining atmosphere, for example they are implemented for entertaining purposes (augmented service).

Dinner type was manipulated by asking participants to choose whether they would eat dinner in the chosen restaurant alone (individual condition) or with friends/family (group condition). Participants were shown three images of real service robots depicting a robot at work. The scenario and questions in details are shown in Section IV: Product Level Theory section in APPENDICES.

3.5.1.5 Technology Acceptance Model

Participants provided responses to all questions on a 5-point Likert scale relating to Perceived Usefulness (PU), Perceived Enjoyment (PE), Perceived Ease of Use (PEOU), customer satisfaction with the experience, and the extension of their experience. The scale utilized in this section of the questionnaire can be referenced in Table 3.1. Detailed information on the statements surveyed and the corresponding answers for each section are outlined in the Section V: Technology Acceptance Model & The Overall Experience Satisfaction and Extension section in APPENDICES.

Table 3.1: The five-point Likert scale

Reacting to the Assertion	Code of the Assertion
Strongly Dispute	1
Dispute	2
Neither Concur nor Dispute	3
Concur	4
Strongly Concur	5

Source: Sani et al., 2020

3.5.1.6 Overall Experience Satisfaction & Extension

The final segment examines the respondents' overall satisfaction with their experience. Subsequently, participants were surveyed on their inclination to endorse and promote the robot service restaurant by sharing their experience, recommending it to others, posting positive feedback on social media, supporting it, and revisiting the establishment.

3.5.2 Interviews

Interviews are performed with a subset of employees from selected restaurants to understand their attitudes toward collaborating with robots in the workplace. The interviews are designed to get more in-depth information on employee experience, and they will be held in person. It consists of two sections, the first discusses the interest of employee's perspective, including employees' satisfaction and reaction towards employing robots alongside them to work in the restaurant. The second section discusses the case from the restaurants' interest perspective, whether it is a boon or bane are discussed. The interview questions are mentioned in Appendix-B: INTERVIEW QUESTIONS.

3.6 Methods of Analyzing Hypothesis

Data analysis, according to Nassaji (2015), offers a valuable means to effectively utilize statistical tools in a more coherent manner. These tools play a crucial role in visualizing, interpreting, and scrutinizing data. In-depth consideration of the appropriate data analysis tool is crucial, and its selection is intricately linked to the specific characteristics of the research being conducted, whether qualitative or quantitative. The choice of tool is heavily influenced by the type of data being utilized and the methods employed for data collection. In the present research endeavour, a comprehensive mixed methodological approach was embraced, which entailed gathering primary data through a blend of qualitative and quantitative methods. To scrutinize both the qualitative and quantitative research structures, a diverse array of analytical instruments and techniques was applied, ensuring a meticulous evaluation of the study's data landscape.

In the ongoing study, the collection of data is facilitated through the administration of questionnaire and conducting interviews. The approach encompasses the utilization of various statistical techniques, including both descriptive and inferential methods such as t-tests, correlations, frequency analysis, and demographic evaluation. These statistical analyses were conducted utilizing the SPSS tool. The correlation examination aimed to establish connections between variables and their influences, while the demographic assessment focused on understanding respondent characteristics. The information obtained from interviews underwent a thorough assessment using thematic analysis, wherein unique themes were scrutinized and interpreted.

CHAPTER IV

RESULTS ANALYSIS AND DISUSSION

4.1 Introduction

The primary objective of this study revolves around investigating the level of satisfaction among customers regarding the utilization of AI-driven robotic services, as well as delving into the sentiments and perceptions of employees towards this technological advancement. This section looks closely at the results about perceived usefulness, usability, enjoyment, satisfaction, acceptance, adoption, extension of the experience, and owners' delight. The data came from questionnaire and interviews with employees at robotic restaurants in Istanbul, and customers who visited them.

The questionnaire results were examined using analysis methods like demographics, frequencies, and correlations to test the hypothesis. The findings are explained through descriptions and tables. Demographics looks at characteristics, while correlations explore relationships between variables. Utilizing the analytical tool SPSS Statistics 29, the researchers conducted statistical tests and interpreted the hypotheses derived from the original data. The software facilitated the rigorous examination of the data to validate the research.

In a meticulous examination, the interviews underwent thorough scrutiny utilizing thematic analysis, revealing patterns that were directly related to the research objectives and the responses provided during the interviews. Furthermore, an integral component of this process involves an in-depth discussion that aims to delve deeper into the uncovered discoveries.

4.2 Customers' Questionnaire

4.2.1 Excluded Data

Table 4.1 shows that 96.2% of respondents visited eateries utilizing robots, while only 3.8% had not. This indicates most surveyed individuals experienced robot-assisted dining. However, the vast majority's exposure contrasts with a minor fraction lacking that experience. The data suggests widespread familiarity with robotic restaurant services in the sample population, albeit focusing solely on those who've encountered

such establishments. Consequently, inferences drawn exclusively reflect perspectives of patrons at robot integrated eateries, excluding viewpoints of those unfamiliar with this dining format. This limitation must be considered when interpreting the findings.

Table 4.1: Respondents' Experience, if any

		Frequency	Percent
Have you ever visited a restaurant that implement robots in Istanbul?	Yes, I visited restaurant that use robots for services.	150	96.2
	No, I have not visited a robotic restaurant ever.	6	3.8

Source: Author Finding

4.2.2 Respondents' Demographical Profile

Recent studies conducted by Kanim and Cid (2020), have highlighted the significance of demographic analysis as a prevalent approach in research investigations. This method involves a comprehensive examination of various demographic factors to gain insights into specific populations. It aids researchers in identifying the trends and features of a specific group. Furthermore, the study highlights that demographic profiling is significantly utilized as a tool to interpret the various characteristic traits of the populace.

The demographic details of the questionnaire participants comprised six variables, illustrated in Table 4.2, encompassing a broad age spectrum from under 20 years to over 41 years. Among the 150 respondents, a significant majority fell within the millennial category, aged between 21 and 30 (37.3%), with the next largest group falling between 31 and 40 years (29.3%). A smaller fraction of participants was either below 20 years of age (15.3%) or above 41 years old (18.0%). The demographic breakdown within the sample of 150 individuals revealed a notable disparity in gender representation, with a higher proportion of women (59.3%) as opposed to men (40.7%). Furthermore, the analysis highlighted a predominance of respondents within the younger adult demographic, with a clear inclination towards the female segment. This points to a bias in the sample towards younger age brackets and a slightly elevated female population representation.

Concerning educational background, the majority of individuals in the questionnaire possess a bachelor's degree (47.3%), with high school graduates comprising the second largest group (33.3%). A minor fraction has finished elementary school (8.0%) or engaged in postgraduate studies (11.3%). The considerable proportion of the individuals involved in the study have successfully completed a minimum of a bachelor's degree, indicating a sample that is relatively highly educated. This factor might impact their viewpoints and actions towards robotic dining establishments.

The distribution of income among questionnaire participants varies significantly, with a notable percentage situated in middle-income categories. This indicates a broad representation of income strata within the sample, potentially influencing their preferences and behaviours related to dining experiences. In examining the income distribution among the surveyed individuals, a notable trend emerges where the largest share falls within the income bracket of 20,001 to 40,000, constituting 43.3% of the respondents. Following closely behind are individuals falling within the 40,001 to 60,000 income range, comprising 26.0% of the total respondents.

The division between individuals choosing to dine at the robotic restaurant alone or with a group is fairly equal, suggesting a range of preferences in terms of dining companionship. Questionnaire participants are equally split, with 43.3% opting to visit the robotic restaurant solo and 56.7% opting to go in a group. The frequency of visits to the robotic restaurant is evenly spread among the respondents. About one-third of the participants visited once (34.7%), while another third visited 2-4 times (32.7%). The remaining third visited more than four times (32.7%). The questionnaire indicates a balanced preference between dining alone or with a group at the robotic restaurant, highlighting varied companionship choices. Moreover, the frequency of visits to the robotic restaurant is evenly distributed, with a considerable number of respondents visiting multiple times.

In essence, analyzing the demographic traits and visitation patterns offers valuable perspectives on the characteristics and inclinations of patrons frequenting automated dining establishments. Such observations prove beneficial in comprehending consumer conduct and customizing offerings to align with the varying requirements of demographic groups.

Table 4.2: Respondents' Profile

		Frequency	Percent
Age	Less than 20 years	23	15.3
	Between 21 and 30 years	56	37.3
	Between 31and 40 years	44	29.3
	More than 41 years	27	18.0
Gender	Female	89	59.3
	Male	61	40.7
Educational Qualification	Primary School	12	8.0
	High School	50	33.3
	Undergraduate School	71	47.3
	Postgraduate School	17	11.3
Monthly Income	≤ 20,000	26	17.3
	20,001-40,000	65	43.3
	40,001-60,000	39	26.0
	≥60,001	20	13.3
Mode of Visiting the Robotic Restaurant	Solo	65	43.3
	In Group	85	56.7
How frequently visited Robotic Restaurant?	One time	52	34.7
	2-4 Times	49	32.7
	More than 4 Times	49	32.7

Source: Author Finding

4.2.3 Variables' Frequency Analysis

In this comprehensive section, a detailed analysis is presented regarding the frequency analysis conducted to assess how participants responded to the impact of AI-driven robots in restaurants on customer satisfaction. The research delves deep into exploring the diverse preferences of customers when it comes to engaging with robots in different service sectors. A meticulous questionnaire was meticulously crafted, comprising scenario-driven questions, with the aim of uncovering the intricate nuances of customers' perceptions and behaviours in relation to interacting with robotic systems

within the restaurant setting. Participants were presented with a choice of service categories in three distinct restaurants incorporating robots and were required to indicate their preferred dining setting either solo or in a group.

In the analysis, participant responses are classified into three tiers: core, facilitating, and augmented levels. The allocation of responses among these tiers reflects the perceived significance or pertinence of each tier concerning the product or service under assessment. For instance, as illustrated in Table 4.3, 36.7% of the surveyed individuals favoured interactions with service robots at the core level (such as cooking and food preparation), 38.0% showed a preference for the facilitating level (including functions like food delivery, ordering, and payment management), and finally, 25.3% expressed a preference for encountering robots at the augmented level (for instance, for customer entertainment and hosting purposes).

Respondents' choices regarding dining are segmented into two categories: dining solo or dining with a group. Analysing the responses, the distribution between these choices signifies the popularity of each preference within the respondents. A substantial percentage favoured dining with a group (52.7%), while an almost equal proportion opted for dining alone (47.3%), highlighting a variety of dining preferences among the surveyed individuals.

Table 4.3: Product Level Theory

Product Level Theory		Core Level	Facilitating Level	Augmented Level	Alone (solo diner)	In a group
	N	55	57	38	71	79
	%	36.7%	38.0%	25.3%	47.3%	52.7%

Source: Author Finding

In the categorization of responses to the aforementioned items, they are divided into five distinct categories: strongly dispute, dispute, neither concur nor dispute, concur, and strongly concur. This hierarchical structuring aids in assessing the extent of agreement or disagreement among respondents. Each item's response breakdown illustrates the percentage of participants selecting each degree of concurrence or dissent with the provided statements in a comprehensive and detailed manner.

In examining PU1, PU2, and PU3, a considerable proportion of the questionnaire participants conveyed either their approval or strong endorsement of the statements being assessed. Specifically, the overall percentage of respondents who indicated their agreement or strong agreement with each statement ranged from 53.7% to 55.3%, indicating a favourable perception of the statements. Despite the prevailing consensus among respondents, there are notable percentages of individuals who either maintained a neutral stance or expressed disagreement with the statements, as illustrated in Table 4.4. This demonstrates a nuanced spectrum of perspectives among the participants, ranging from agreement to dissent regarding the evaluated statements.

The findings suggest that while there is general agreement on the factors assessed in PU1, PU2, and PU3, there is a range of perspectives among respondents in terms of their perceptions and attitudes towards these factors. Some individuals exhibit neutrality or disagreement towards these elements, showcasing a diverse spectrum of viewpoints within the respondent group. A more detailed examination could delve into the causes of this diversity in responses and pinpoint potential influences on how respondents perceive or feel about the statements. This could lead to developing approaches to enhance communication, tackle concerns, or boost overall satisfaction.

Table 4.4: Perceived Usefulness

		Strongly Dispute	Dispute	Neutral	Concur	Strongly Concur
PU1	N	10	27	34	64	15
	%	6.7%	18.0%	22.7%	42.7%	10.0%
PU2	N	9	32	25	67	17
	%	6.0%	21.3%	16.7%	44.7%	11.3%
PU3	N	6	27	37	66	14
	%	4.0%	18.0%	24.7%	44.0%	9.3%

Source: Author Finding

The responses for the PE items reflect a diverse range of perceptions or attitudes among the participants, as illustrated by the distribution of responses across the five

rating levels. Across PE1, PE2, and PE3, the percentages of respondents who indicated strong agreement or agreement varied between about 48.7% to 53.3%, 41.3% to 52%, and 48.3% to 54.3%, respectively. Although a considerable number of respondents agreed or strongly agreed with the statements evaluated in these areas, there were also notable proportions of respondents who either disagreed or remained neutral. In this case, the proportions of participants selecting neutral or opposing views varied between around 17.3% to 33.3% for PE1, 21.3% to 36.7% for PE2, and 20% to 30% for PE3, as outlined in Table 4.5.

The findings suggest that the respondents demonstrate varied opinions or attitudes concerning the statements assessed in PE1, PE2, and PE3. The diversity in viewpoints captured in the questionnaire reflects differing interpretations or understandings of the content presented. It would be beneficial to conduct a more in-depth examination to understand the factors contributing to these varying responses and to pinpoint influences affecting how the respondents view the statements. This could lead to the development of approaches to enhance communication, tackle concerns, and improve overall satisfaction levels.

Table 4.5: Perceived Enjoyment

		Strongly Dispute	Dispute	Neutral	Concur	Strongly Concur
PE1	N	7	20	50	54	19
	%	4.7%	13.3%	33.3%	36.0%	12.7%
PE2	N	11	21	55	40	23
	%	7.3%	14.0%	36.7%	26.7%	15.3%
PE3	N	10	22	45	47	26
	%	6.7%	14.7%	30.0%	31.3%	17.3%

Source: Author Finding

In examining the Perceived Ease of Use (PEOU) components, a considerable number of respondents expressed either their agreement or strong agreement with the statements being assessed. More precisely, the collective percentage of respondents

showing agreement or strong agreement for each item falls within the range of around 53.3% to 53.7%, suggesting a positive sentiment towards the statements. Despite the prevalent agreement among the respondents, there are also noteworthy percentages of individuals who reported neutrality or disagreement with the statements as illustrated in Table 4.6.

The results indicate an overall consensus regarding the evaluated items or statements in PEOU1, PEOU2, and PEOU3. However, there is also diversity in how respondents perceive or feel about them, including instances of neutrality or disagreement. Deeper investigation may delve into the causes of this diversity in responses and pinpoint factors that influence respondents' perceptions or attitudes towards these statements. The discoveries revealed through these findings have the potential to play a pivotal role in the formulation of effective strategies aimed at improving communication effectiveness, addressing challenges, and elevating the overall levels of satisfaction.

Table 4.6: Perceived Ease of Use

		Strongly Dispute	Dispute	Neutral	Concur	Strongly Concur
PEOU1	N	12	22	36	50	30
	%	8.0%	14.7%	24.0%	33.3%	20.0%
PEOU2	N	8	24	38	52	28
	%	5.3%	16.0%	25.3%	34.7%	18.7%
PEOU3	N	3	24	47	47	29
	%	2.0%	16.0%	31.3%	31.3%	19.3%

Source: Author Finding

In evaluating all aspects of satisfaction across various experiences, there is a discernible spread of responses spanning five levels. The proportion of participants who indicated strong agreement or agreement varied from around 57.3% to 57.6% for ES1, 54.6% to 57.6% for ES2, and 55.3% to 55.3% for ES3. While a considerable number of respondents agreed or strongly agreed with the evaluations in ES1, ES2, and ES3, there were also notable percentages of individuals who expressed either

neutrality or disagreement. Specifically, the percentage of respondents indicating neutrality or disagreement ranged from approximately 17.3% to 23.3% for ES1, 17.3% to 22.0% for ES2, and 15.0% to 20.0% for ES3 as presented in Table 4.7.

The results suggest that although there is a consensus on the topics evaluated in ES1, ES2, and ES3, there exists diversity in how respondents perceive or feel about them. Some individuals exhibit neutrality or disagreement. Delving deeper into this diversity could reveal the underlying causes and factors that impact how respondents view these statements. Understanding these factors could aid in developing strategies to enhance communication, address issues, and improve overall satisfaction levels.

Table 4.7: Experience Satisfaction

		Strongly Dispute	Dispute	Neutral	Concur	Strongly Concur
ES1	N	9	17	38	51	35
	%	6.0%	11.3%	25.3%	34.0%	23.3%
ES2	N	9	17	42	47	35
	%	6.0%	11.3%	28.0%	31.3%	23.3%
ES3	N	9	13	45	45	38
	%	6.0%	8.7%	30.0%	30.0%	25.3%

Source: Author Finding

In all facets of experience extension-related items, there exists a diverse spread of responses among the five tiers. The proportion of participants who opted for strongly agreeing or agreeing varied from around 56.0% to 65.3% for EE1, from 59.3% to 68.7% for EE2, and from 60.6% to 65.6% for EE3. Although the majority of participants supported or strongly supported the statements evaluated in EE1, EE2, and EE3, there were also significant percentages of participants who indicated neutrality or disagreement. Specifically, the proportion of participants who chose neutral or Dispute ranged from approximately 14.0% to 22.0% for EE1, from 16.7% to 28.0% for EE2, and from 14.0% to 16.0% for EE3 (Table 4.8).

The results suggest that although there is a general consensus on the items evaluated in EE1, EE2, and EE3, there exists variability in how respondents perceive or feel about them, with some showing neutrality or disagreement. A more in-depth examination could delve into the causes of this response variability and pinpoint potential factors that shape respondents' attitudes toward these statements. This analysis could in turn guide the development of strategies aimed at enhancing communication, dealing with issues, and improving overall satisfaction levels.

Table 4.8: Experience Extension

		Strongly Dispute	Dispute	Neutral	Concur	Strongly Concur
EE1	N	6	15	44	46	39
	%	4.0%	10.0%	29.3%	30.7%	26.0%
EE2	N	6	18	37	59	30
	%	4.0%	12.0%	24.7%	39.3%	20.0%
EE3	N	3	18	38	47	44
	%	2.0%	12.0%	25.3%	31.3%	29.3%

Source: Author Finding

To sum up, the majority of categories exhibit elevated percentages in the 'Concur' and 'Strongly Concur' responses, indicating a favourable consensus on the presented statements or queries. Notably, categories such as "ES3," "EE1," and "EE3" demonstrate notably high percentages in the 'Strongly Concur' category, implying a robust positive reception or consensus. In the chart labelled as Figure 4.1, the y-axis reflects response percentages, ranging from 0 to 50%. This implies a substantial number of participants in the questionnaire, enabling a more detailed breakdown of responses.

The prevalence of 'Concur' and 'Strongly Concur' responses indicates that the questionnaire topic was well-received or that the statements were favourably inclined. This visual representation effectively highlights the opinion distribution,

demonstrating a tendency towards agreement among respondents, potentially reflecting a positive result from customer feedback.

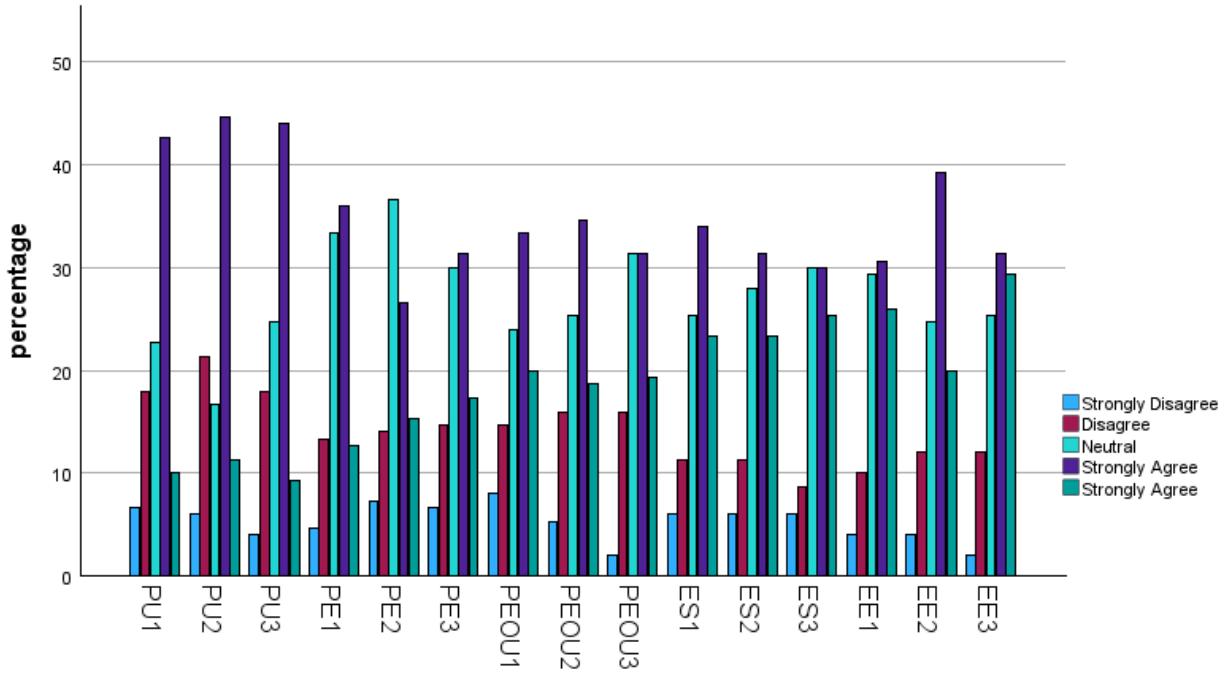

Figure 4.1: Bar Chart for The Likert Scale Statement

Source: Author Finding

4.2.4 Hypothesis Testing & Correlation Analysis

In the realm of statistics, various statistical tools are employed to examine the impact and relationships between different variables. Among these tools, the correlation analysis stands out as a powerful method for assessing these relationships. According to a study by Babbie et al. (2022), the Pearson Correlation coefficient, denoted as 'r', serves as a key statistical metric used to explore the associations between variables. This coefficient typically ranges from 0 to 1, signifying the strength and direction of the correlation. The Pearson Coefficient is a vital statistical measure used to determine the relationship between two variables, showcasing whether it is positive or negative. It is a scale that ranges from -1 to 0 and from 0 to 1, where values closer to 0 suggest a weak correlation, those between 0.3 and 0.7 indicate a moderate correlation, and figures from 0.7 to 1 reveal a strong correlation between the independent and dependent variables. This coefficient plays a crucial role in quantifying the strength

and direction of the relationship between variables, thereby aiding in making informed decisions based on data analysis.

In this study, correlation analysis will be utilized to examine the relationship between the independent variable and each of the dependent variables. The research will specifically focus on evaluating the proposed research hypotheses in a comprehensive manner to determine the strength and direction of the associations.

4.2.4.1 The Correlation Between Easiness and Usefulness of Using Robotics

A strong positive correlation has been identified between the perceived usefulness and perceived ease of operation. This relationship is supported by a Pearson correlation coefficient of .673 in Table 4.9, which is statistically significant at the 0.01 level (two-tailed), denoting a significant association between these two variables. This statistical finding indicates a clear tendency for perceived utility ratings to either increase or decrease in conjunction with perceived ease of use ratings. In essence, the results suggest that individuals tend to rate the utility of a product or service in alignment with how easy it is perceived to operate. This correlation underscores the importance of both utility and ease of use perception in shaping overall user experience and satisfaction levels.

In-depth analysis reveals that diners tend to perceive a system as more user-friendly when they consider it to be more beneficial and vice versa. This correlation provides valuable insights into the interconnected nature of perceived usefulness and ease of use, highlighting their crucial roles in shaping user perceptions and satisfaction with a system. It reaffirms hypothesis 1a, indicating that the belief in a system's ease of use is intricately linked to the belief in its utility. This intricate relationship underscores the importance of users' perceptions in determining their contentment with and adoption of a system. Understanding the interplay between perceived usefulness and user-friendliness is essential for designing systems that meet users' needs effectively and enhance their overall experience.

Table 4.9: Correlation Between Perceived Ease of Use and Perceived Usefulness

		Perceived Usefulness	Perceived Ease of Use
Perceived Usefulness	Pearson Correlation	1	.673**
	Sig. (2-tailed)		0.000
Perceived Ease of Use	Pearson Correlation	.673**	1
	Sig. (2-tailed)	0.000	
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Finding

4.2.4.2 The Correlation Between Easiness and Enjoyment of Using Robotics

A notable and strong positive relationship is observed between the perceived level of enjoyment and the perceived level of ease of use, which is supported by a Pearson correlation coefficient of .578, as detailed in Table 4.10.The perception of usability plays a crucial role in users' experiences with a system. Understanding how individuals associate ease of use with enjoyment sheds light on the intricate relationship between perceived enjoyment and perceived ease of use. Users tend to derive more pleasure from using a system that they perceive as user-friendly, whereas encountering a system they view as cumbersome diminishes their enjoyment. This intricate connection highlights the substantial impact of usability on users' satisfaction and delight when interacting with a system. Therefore, hypothesis 1b, which asserts that perceiving a system as easy to use is directly correlated with finding it enjoyable, is substantiated. This finding underscores how users' satisfaction and pleasure are heavily influenced by their perceptions of a system's ease of use.

Table 4.10 This correlation demonstrates statistical significance at the 0.01 level (two-tailed), indicating a highly significant correlation between these two variables. It suggests a clear tendency for the ratings of enjoyment to increase or decrease in line with the ratings of ease of use. This correlation coefficient reveals the degree to which

changes in the perception of ease of use correspond to changes in the perception of enjoyment, showing a consistent pattern of behaviour between these two factors.

The perception of usability plays a crucial role in users' experiences with a system. Understanding how individuals associate ease of use with enjoyment sheds light on the intricate relationship between perceived enjoyment and perceived ease of use. Users tend to derive more pleasure from using a system that they perceive as user-friendly, whereas encountering a system they view as cumbersome diminishes their enjoyment. This intricate connection highlights the substantial impact of usability on users' satisfaction and delight when interacting with a system. Therefore, hypothesis 1b, which asserts that perceiving a system as easy to use is directly correlated with finding it enjoyable, is substantiated. This finding underscores how users' satisfaction and pleasure are heavily influenced by their perceptions of a system's ease of use.

Table 4.10: Correlation Between perceived Ease of Use and Perceived Enjoyment

		Perceived Enjoyment	Perceived Ease of Use
Perceived Enjoyment	Pearson Correlation	1	.578**
	Sig. (2-tailed)		0.000
Perceived Ease of Use	Pearson Correlation	.578**	1
	Sig. (2-tailed)	0.000	
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Finding

4.2.4.3 The Correlation Between Experience Satisfaction and Easiness

A substantial and direct positive relationship can be observed between the satisfaction derived from a particular experience and the perceived ease of use. This connection is supported by a Pearson correlation coefficient of .629, as displayed in Table 4.11. The statistical significance of this correlation at the 0.01 level (1-tailed) indicates a noteworthy and profound link between these two variables. This suggests a clear

tendency for satisfaction ratings based on experiences to either increase or decrease depending on the perception of ease of use. Through the data presented, it is evident that the level of satisfaction experienced by individuals is closely intertwined with how they perceive the ease with which they can interact with a product or service.

User satisfaction is strongly influenced by the ease of use of a system. When individuals perceive a system as simple to navigate, they are more likely to express elevated levels of satisfaction with their overall experience. Conversely, individuals who encounter difficulties while using the system tend to report lower levels of satisfaction. This observation aligns with hypothesis 2a, which suggests that the perceived ease of use positively influences satisfaction levels. This correlation sheds light on the intricate relationship between user satisfaction and the perceived ease of use. It emphasizes the critical role of user-friendly interfaces in shaping not only user satisfaction but also the holistic system experience. This highlights the importance of designing systems that prioritize ease of use to enhance user satisfaction and overall user experience.

Table 4.11: Correlation Between Experience Satisfaction and Perceived Ease of Use

		Experience Satisfaction	Perceived Ease of Use
Experience Satisfaction	Pearson Correlation	1	.629**
	Sig. (1-tailed)		0.000
Perceived Ease of Use	Pearson Correlation	.629**	1
	Sig. (1-tailed)	0.000	
**. Correlation is significant at the 0.01 level (1-tailed).			

Source: Author Finding

4.2.4.4 The Correlation Between Experience Satisfaction and Usefulness

The data analysis uncovers a noteworthy and strong positive connection between the level of satisfaction gained from an experience and the perceived usefulness, evident

by a Pearson correlation coefficient of .565 outlined in Table 4.12. This statistical correlation carries significance at the 0.01 level (1-tailed), underscoring a deep and substantial relationship between these two variables. The findings imply a trend where the ratings for experience satisfaction tend to rise or fall proportionately with the ratings for perceived usefulness.

People who view a system as more beneficial typically express greater satisfaction with their complete encounter, while conversely, those who find it less useful are less content. This connection affirms the confirmation of hypothesis 2b: Perceived usefulness has a positive impact on experience satisfaction. Such a correlation offers valuable perspectives regarding how satisfaction from an experience and the perceived utility are interrelated, underlining the crucial role of perceived utility in influencing users' satisfaction levels and their overall encounters with a system.

Table 4.12: Correlation Between Experience Satisfaction and Perceived Usefulness

		Experience Satisfaction	Perceived Usefulness
Experience Satisfaction	Pearson Correlation	1	.565**
	Sig. (1-tailed)		0.000
Perceived Usefulness	Pearson Correlation	.565**	1
	Sig. (1-tailed)	0.000	
**. Correlation is significant at the 0.01 level (1-tailed).			

Source: Author Finding

4.2.4.5 The Correlation Between Experience Satisfaction and Enjoyment

The relationship between the satisfaction gained from an experience and the perceived level of enjoyment is markedly positive, as indicated by a Pearson correlation coefficient of .499 (see Table 4.13). This correlation is proven to be statistically significant at the 0.01 level (one-tailed), demonstrating a robust connection between these two variables. This finding suggests that as satisfaction levels from experiences

increase or decrease, the corresponding ratings for perceived enjoyment also exhibit a similar trend. This association underscores the importance of how individuals' satisfaction with their experiences influences their enjoyment levels.

Put simply, those who find greater pleasure in utilizing a system typically express increased contentment with their overall interaction, and conversely, reinforcing hypothesis 2c [Perceived enjoyment has a positive impact on experience satisfaction]. This association offers valuable understandings concerning the connection between satisfaction derived from experience and the perception of enjoyment, underscoring the significance of enjoyment in influencing users' satisfaction levels and their holistic engagement with a system.

Table 4.13: Correlation Between Experience Satisfaction and Perceived Usefulness

		Experience Satisfaction	Perceived Enjoyment
Experience Satisfaction	Pearson Correlation	1	.499**
	Sig. (1-tailed)		0.000
Perceived Enjoyment	Pearson Correlation	.499**	1
	Sig. (1-tailed)	0.000	
**. Correlation is significant at the 0.01 level (1-tailed).			

Source: Author Finding

4.2.4.6 The Correlation Between the Acceptance Level of AI-Assisted Robotic Services and Diner Type

The data analysis indicates a slight negative correlation between the satisfaction level regarding the dining experience and the category of customers patronizing the automated eatery, as shown by a Pearson correlation coefficient of -.035 (refer to Table 4.14). This correlation is considered statistically insignificant at the 0.05 level of significance (2-tailed), given the p-value of .669. This suggests that, according to the data at hand, there is no substantial connection between the satisfaction level and the

customer type. In simpler terms, whether a customer dines solo or in a group does not significantly impact their perception of the dining experience. It is worth noting that the correlation coefficient is close to zero, indicating an extremely weak association between these two variables. This observation suggests that even though there is a correlation, it is so weak that it essentially does not exist in practical terms, emphasizing the lack of considerable influence that customer type has on the satisfaction level of the dining experience in the robotic restaurant.

In the domain of statistical hypothesis testing, thorough analysis has conclusively revealed the absence of any statistically significant disparity between the two variables under scrutiny. This finding has led to the rejection of hypothesis 3a, which specifically postulated that the level of acceptance towards AI-assisted robotic services may vary across different segments of customer diners.

Table 4.14: Correlation Between Experience Acceptance Level and Diner Type

		Experience Acceptance Level	Diner Type
Experience Acceptance Level	Pearson Correlation	1	-0.035
	Sig. (2-tailed)		0.669
Diner Type	Pearson Correlation	-0.035	1
	Sig. (2-tailed)	0.669	

Source: Author Finding

4.2.4.7 The Correlation Between the Acceptance Level of AI-Assisted Robotic Services and Diner Age Group

There is a notable inverse link between the level of experience acceptance and age group, denoted by a Pearson correlation coefficient of -.364 in Table 4.15. This correlation holds significance at the 0.01 level (two-tailed), signifying a highly substantial association between the two factors. An inverse correlation suggests that as the age category increases, the acceptance level of the experience typically diminishes,

and conversely, decreases with a decrease in age group. In this scenario, as individuals' age bracket rises, their willingness to accept the experience declines.

This indicates that younger people might have a greater inclination to embrace new situations than older individuals. Yet, it is essential to note that correlation does not equate to causation, necessitating additional investigations to unveil the fundamental determinants impacting this connection. Within statistical hypothesis testing, a notable variance between the two factors exists, resulting in the acceptance of hypothesis 3b: The acceptance level of AI-assisted robotic services differs among various customer age groups.

Table 4.15: Correlation Between Experience Acceptance Level and Age Group

		Experience Acceptance Level	Age Group
Experience Acceptance Level	Pearson Correlation	1	-.364**
	Sig. (2-tailed)		0.000
Age Group	Pearson Correlation	-.364**	1
	Sig. (2-tailed)	0.000	
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Finding

4.2.4.8 The Correlation Between the Acceptance Level of AI-Assisted Robotic Services and Diner Educational Qualification

In the analysis conducted, it was revealed that there exists a tiny inverse relationship between the extent of acceptance of one's experiences and their educational credentials. The Pearson correlation coefficient value of -.049, outlined in Table 4.16. indicates this association. However, it is important to note that this correlation does not demonstrate statistical significance at the 0.05 level (two-tailed), given the p-value of .549. This indicates that, based on the data provided, there is no substantial connection between the variables. It implies that the acceptance level of AI-driven

robotic services shows minimal variation based on the educational backgrounds of individuals.

Upon examining the correlation analysis given, it is evident that no statistically significant variance exists between the variables, suggesting that the observed association is not a result of random occurrences. This results in the rejection of hypothesis 3c [The acceptance level of AI-assisted robotic services differs among various customer educational qualifications].

Table 4.16: Correlation Between Experience Acceptance Level and Educational Qualification

		Experience Acceptance Level	Educational Qualification
Experience Acceptance Level	Pearson Correlation	1	-0.049
	Sig. (2-tailed)		0.549
Educational Qualification	Pearson Correlation	-0.049	1
	Sig. (2-tailed)	0.549	

Source: Author Finding

4.2.4.9 The Correlation Between the Acceptance Level of AI-Assisted Robotic Services and Diner gender

Following the correlation examination on Experience Acceptance Level and Gender, it was determined that the Pearson correlation coefficient stands at -.092. Moreover, the observed significance level or p-value is .265 as per Table 4.17. Given that the p-value exceeds the standard threshold of 0.05 for statistical significance, we uphold the null hypothesis. Thus, no statistically substantial correlation exists between experience acceptance level and gender.

Given that the correlation lacks statistical significance, it is not viable to ascertain a notable association between the level of experience acceptance and gender. Consequently, no substantial statistical variance between these two variables is evident

from the analysis presented, leading to the rejection of hypothesis 3d [The acceptance level of AI-assisted robotic services differs among various customer gender demographics].

Table 4.17: Correlation Between Experience Acceptance Level and Gender

		Experience Acceptance Level	Gender
Experience Acceptance Level	Pearson Correlation	1	-0.092
	Sig. (2-tailed)		0.265
Gender	Pearson Correlation	-0.092	1
	Sig. (2-tailed)	0.265	

Source: Author Finding

4.2.4.10 The Correlation Between Customer Experience Acceptance Level and Incorporating Robotic Technology at The Core Level

The Pearson correlation coefficient indicates a weak negative correlation of -.192 between the Experience Acceptance Level and Core Service (refer to Table 4.18). This correlation suggests that as the perception of Core Service increases, the Experience Acceptance Level may slightly decrease. Further inquiry is recommended to explore the reasons behind the observed decrease in acceptance of the overall experience with an increase in the perception of core service.

The correlation is deemed substantial at a significance level of .05 (two-tailed), with a p-value of .018. This suggests that the established correlation between the acceptance level of experience and the core service is statistically noteworthy. Given the statistical significance of the correlation, it can be inferred that a substantial link exists between the variables. This indicates a strong and meaningful relationship that is supported by empirical data and analysis.

Hence, a notable variance exists between the two parameters, implying that alterations in fundamental service perception could potentially influence the level of acceptance

of the experience (Hypothesis 4a [Incorporating robotic technology at the core level of a service will impact customer experience acceptance level positively] is supported). It is advisable to conduct additional research to gain insights into the dynamics of this correlation and its consequences on user experience.

Table 4.18: Correlation Between Experience Acceptance Level and Core Services

		Experience Acceptance Level	Core Service
Experience Acceptance Level	Pearson Correlation	1	-.192*
	Sig. (2-tailed)		0.018
Core Service	Pearson Correlation	-.192*	1
	Sig. (2-tailed)	0.018	
*. Correlation is significant at the 0.05 level (2-tailed).			

Source: Author Finding

4.2.4.11 The Correlation Between Customer Experience Acceptance Level and Incorporating Robotic Technology at The Facilitating Level

The correlation analysis indicates a Pearson correlation coefficient of .170 between the level of acceptance of experience and the efficacy of the facilitating service, as presented in Table 4.19. This value implies a subtle positive correlation between these two factors, implying an inclination for a slight increase in experience acceptance levels with variations in facilitating service. The statistical significance of this weak positive correlation suggests a meaningful association between the variables.

The correlation has a noteworthy significance level at .05 (two-tailed), accompanied by a p-value of .037. his signifies that the established relationship between the variables carries significant statistical significance. Consequently, there exists a statistically substantial disparity between the two variables, providing evidence for hypothesis 4b [Incorporating robotic technology at the facilitating level of a service

will impact customer satisfaction positively], indicating that alterations in enhancing service perception could influence the level of acceptance of the experience.

Table 4.19: Correlation Between Experience Acceptance Level and Facilitating Services

		Experience Acceptance Level	Facilitating Service
Experience Acceptance Level	Pearson Correlation	1	.170*
	Sig. (2-tailed)		0.037
Facilitating Service	Pearson Correlation	.170*	1
	Sig. (2-tailed)	0.037	
*. Correlation is significant at the 0.05 level (2-tailed).			

Source: Author Finding

4.2.4.12 The Correlation Between Customer Experience Acceptance Level and Incorporating Robotic Technology at The Augmented Level

The Pearson correlation coefficient indicates a negligible positive correlation of .023 between the experience acceptance level and augmented service Table 4.20. This value implies that there is no observable pattern of the experience acceptance level varying with changes in augmented service perception. As the correlation lacks statistical significance, it is not feasible to deduce a substantial connection between Experience Acceptance Level and Augmented Service.

At the two-tailed .05 significance level, the correlation identified does not meet statistical significance, evidenced by a p-value of .779. Thus, according to the correlation analysis results, there is no substantial difference between the variables under consideration, leading to the rejection of hypothesis 4c: Incorporating robotic technology at the augmented level of a service will impact customer satisfaction positively.

Table 4.20: Correlation Between Experience Acceptance Level and Augmented Services

		Experience Acceptance Level	Augmented Service
Experience Acceptance Level	Pearson Correlation	1	0.023
	Sig. (2-tailed)		0.779
Augmented Service	Pearson Correlation	0.023	1
	Sig. (2-tailed)	0.779	

Source: Author Finding

4.2.4.13 The Correlation Between the Experience Satisfaction and Experience Expansion

The Pearson correlation coefficient of .614 in Table 4.21 indicates a robust positive correlation between Experience Satisfaction and Experience Expansion. The robust correlation observed suggests a clear pattern wherein the satisfaction derived from experience tends to elevate proportionally with the expansion of experience. The statistical significance of this correlation enables us to infer a substantial and meaningful relationship between the variables, indicating a strong association between the level of experience and the corresponding satisfaction levels.

Based on the correlation analysis provided, it is evident that there is a significant statistical difference between the level of satisfaction derived from an experience and the subsequent expansion of that experience. This finding strongly supports hypothesis five, which posits that the degree of satisfaction plays a pivotal role in driving the expansion of one's experiences.

Table 4.21: Correlation Between Experience Satisfaction and Expansion

		Experience Satisfaction	Experience Expansion
Experience Satisfaction	Pearson Correlation	1	.614**
	Sig. (2-tailed)		0.000
Experience Expansion	Pearson Correlation	.614**	1
	Sig. (2-tailed)	0.000	
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Author Finding

4.2.5 Discussion

Service robots have become increasingly prevalent in the restaurant industry globally, not only to enhance cost efficiency but also to draw in more customers (Akdim et al., 2021; Lu et al., 2021). The surge in the adoption of service robots in restaurants can be attributed to the repercussions of the COVID-19 pandemic. Restaurant proprietors are utilizing these robots to create safer dining spaces and to minimize the potential transmission of viruses (Wan et al., 2020). In comparison to robots stationed in the kitchen, service robots, particularly those engaged in customer interactions, play a pivotal role in service provision by shaping customer perceptions and enhancing their experiences (Wirtz et al., 2018). The increasing prevalence of service robots across various service industries has stimulated numerous researchers (Go, Kang, & Suh, 2020; Park & Pobil, 2013) to investigate customer acceptance using the technology acceptance model. This model seeks to delve deeply into how customers perceive and interact with service robots within the restaurant setting, emphasizing the critical role of these robots in transforming service delivery mechanisms and customer experiences. Furthermore, the integration of service robots into restaurants not only enhances operational efficiency but also underscores the importance of leveraging advanced technologies to meet evolving customer preferences and adapt to changing market dynamics.

The realm of service robotics has witnessed a surge in research efforts aimed at comprehending how consumers perceive and respond to these automated entities. Notably, scholars such as Kim et al. (2019), Lu et al. (2021), Pinxteren et al. (2019), Qiu et al. (2020), and Yoganathan et al. (2021) have contributed significantly to this field. Despite this research growth, there remains ambiguity regarding the variability in customers' willingness to engage with robotic services under different circumstances. This study seeks to delve deeper into this area by examining the attitudes of restaurant-goers towards the integration of robots and categorizing customer segments based on various dimensions of robot-assisted service. The research framework introduced in this study diligently addresses the interplay between functional and emotional factors influencing the willingness of prospective users to embrace service robots within a restaurant environment. The study's insights shed light on the diverse spectrum of perceptions held by restaurant patrons regarding the adoption of robotic services, catering to the preferences of various diners seeking such innovative services.

A structural framework was developed and validated to explore the interconnection among the various elements under examination. The findings from hypothesis testing are summarized in Table 4.22, indicating positive correlations between different sets of variables. The Pearson correlation coefficients range from .023 to .673, reflecting a spectrum of correlations from weak to robust. Out of the thirteen hypothetical relationships established in this study, nine were supported based on the preceding analyses, while the remaining were refuted.

For H1a, H1b, H2a, H2b, and H2c, the hypotheses are supported. These hypotheses involve relationships between various constructs (such as Perceived Ease of Use, Perceived Usefulness, Perceived Enjoyment, and Experience Satisfaction) and show strong or moderate correlations with each other. The correlations are statistically significant with exceptionally low p-values. Perceived usefulness and perceived enjoyment have a strong positive relationship to the perceived ease of use. While satisfaction with the experience has a positive moderately to strongly relation to perceived usefulness, perceived enjoyment, and perceived ease of use.

The hypotheses related to Experience Acceptance Level (EAL) and its relationships with variables such as Diner Type, Educational Qualification, Gender, and Age Group were examined. While hypotheses H3a, H3c, and H3d were found to be not supported

due to weak or very weak correlations and insignificant p-values, hypothesis H3b was validated. Specifically, there was a significant weak negative correlation between EAL and Age Group, supported by a statistically significant low p-value. Regarding hypotheses H4a and H4b, they receive backing as there exists slight connections between EAL and both Core Services and Facilitating Services. These linkages demonstrate statistical importance with minimal p-values. However, hypothesis H4c is refuted as there is only a faint correlation between EAL and Augmented Services, lacking statistical significance due to a high p-value.

In the case of H5, the proposition is upheld, indicating a robust relationship between Experience Satisfaction (ES) and Experience Enjoyment (EE), which is statistically substantial, evidenced by a notably low p-value.

The anticipated outcome of the perceived ease of use on perceived usefulness and perceived enjoyment aligns with the Technology Acceptance Model (TAM). An essential aspect to acknowledge is that the more user-friendly a technology is, the more beneficial it becomes for the user. This correlation is in line with earlier research by Park and Pobil (2013) and Lee et al. (2018). Similarly, this finding coincides with the research conducted by (El-Said & Aziz, 2022).

The significant positive influence of perceived utility on satisfaction with the experience suggests that the extent to which a robot service is embraced is linked to its capability to function as anticipated. This pertains to the robot's efficiency in accurately taking and delivering orders. Consequently, in eateries with underperforming robots that mishandle orders, there will be a lack of approval towards the technology from patrons. Hence, the findings of Tavitiyaman et al. (2020) are corroborated.

Regarding the influence of extending the experience based on satisfaction, it is evident that higher satisfaction levels lead to an increased inclination for customers to prolong their experiences. Consequently, these findings support the findings of Dong and Siu (2013) and El-Said et al. (2021) by emphasizing that content customers are more inclined to communicate their experiences to others.

Table 4.22: Pearson Correlations Between Variables (N=150)

Hypothesis	Variables	Pearson Correlation	t-Value	Correlation Strength	P-Value	Result
H1a	PEOU ↔ PU	0.673	11.07	Strong	Very close to zero	Accepted
H1b	PEOU ↔ PE	0.578	8.644	Moderate	Very close to zero	Accepted
H2a	ES ↔ PEOU	0.629	9.810	Strong	Very close to zero	Accepted
H2b	ES ↔ PU	0.565	8.650	Moderate	Very close to zero	Accepted
H2c	ES ↔ PE	0.499	6.990	Moderate	Very close to zero	Accepted
H3a	EAL ↔ Diner Type	-0.035	-0.426	Very weak	0.669 (not significant)	Rejected
H3b	EAL ↔ Age Group	-0.364	-4.680	Weak	Very close to zero	Accepted
H3c	EAL ↔ Educational Qualification	-0.049	-0.598	Very weak	0.549 (not significant)	Rejected
H3d	EAL ↔ Gender	-0.092	-1.120	Very weak	0.265 (not significant)	Rejected
H4a	EAL ↔ Core Services	-0.192	-2.33	Weak	0.018 (not significant)	Accepted
H4b	EAL ↔ Facilitating Services	0.170	2.100	Weak	0.037 (not significant)	Accepted
H4c	EAL ↔ Augmented Services	0.023	0.281	Very weak	0.779 (not significant)	Rejected
H5	ES ↔ EE	0.614	9.470	Strong	Very close to zero	Accepted
PEOU: Perceived ease of use; PU: Perceived usefulness; PE: Perceived enjoyment; ES: Experience satisfaction; EAL: Experience acceptance level; EE: Experience expansion						

Source: Author Finding

4.3 Employees' Interview

In order to investigate the factors affecting employee contentment regarding the use of robotic technology in restaurants throughout Istanbul, an interview session comprising fifteen members was assembled. Detailed interviews were conducted with the personnel employed at these dining venues to uncover and analyse the predominant themes emerging from their feedback. This thorough examination delved deeply into the various influences that contribute to the level of satisfaction experienced by employees.

4.3.1 Hypothesis Testing & Thematic Analysis

In conducting an in-depth thematic analysis, the focus of the study revolved around exploring the utilization of robotic systems within restaurant environments. This method entailed systematically recognizing recurring patterns and themes in the interview feedback to comprehend the employees' viewpoints and encounters comprehensively. Initially, the analysis sorted the interview feedback into basic codes corresponding to each question's content. These codes were subsequently enhanced and combined to create more comprehensive themes that encompassed interconnected ideas and revelations. The ultimate selection of themes aimed to offer a targeted structure for interpreting the gathered data.

The four core themes offer a thorough framework for examining the interview data, encompassing the roles and duties of the workforce, the incorporation and influence of robotic systems, training and adjustment, and the overall advantages, disadvantages, and sought-after enhancements associated with automation in restaurant operations.

4.3.1.1 Workforce Roles and Responsibilities

This subject delves into a diverse array of responsibilities and functions prevalent in the culinary sector, shedding light on the multitude of tasks executed by personnel within dining establishments. During interviews, individuals described their positions such as serving, cooking, managing, bartending, and other roles, offering detailed insights into the specific tasks linked to each position, illustrating the complex nature of restaurant functions. For example, feedback from question 1 exposed the diverse

responsibilities conducted by managers, which include supervising employees, ensuring customer satisfaction, managing resources, and promoting a positive work atmosphere. Similarly, responses concerning server responsibilities, line cook duties, and front-of-house management responsibilities further emphasize the diversity of roles within restaurant establishments.

In reviewing the various roles and duties within a restaurant setting, it is evident that the workforce is dynamic and varied. Each role, ranging from servers to managers, comes with specific responsibilities crucial for the efficient functioning of the establishment. Analysis of interview data unveiled a comprehensive breakdown of these tasks, highlighting the interconnected web of functions that uphold the restaurant's operations. For example, managers are tasked with supervising staff, ensuring customer contentment, managing resources, and cultivating a conducive work environment. This encompasses a broad spectrum of responsibilities, including inventory management, scheduling, sales data analysis, and performance appraisals. Conversely, servers are accountable for order taking, food and beverage service, and delivering exceptional customer satisfaction. Line cooks, bartenders, and front-of-house personnel each have distinct specialized roles that contribute to the overall dining experience.

Having a comprehensive grasp of these roles and duties is essential for proficiently overseeing and organizing operations within the dining establishment. Through clearly defining the responsibilities linked to each role, proprietors and supervisors in the restaurant industry can enhance resource allocation, streamline processes, and guarantee the efficient operation of the establishment.

4.3.1.2 Interaction and Impact of Robotic Systems

This subject delves into incorporating robotic technology within restaurant activities and its broader implications on efficiency, services, and work dynamics. Findings from questions 2 and 4 provide insights into the direct engagement with robots, duration of collaboration, streamlined procedures, redistribution of human labour, emergence of new roles, and changes in perceptions of work dynamics. For instance, employees noted how the presence of robotic systems enhanced repetitive tasks, led to reallocating human resources to more intricate duties, and altered perceptions of work

dynamics. These observations underline the significant impact of automation on restaurant operations.

The incorporation of automated systems into restaurant functions signifies a notable transformation in the industry's landscape, encompassing significant consequences for productivity, customer service, and employee interactions. Insights gathered from interviews revealed the direct engagements with robots, the duration of cooperation, and the broader operational impact. Staff members detailed how the introduction of automated systems streamlined mundane tasks, resulted in a shift of workforce towards more intricate duties, and altered perspectives on work dynamics. This underscores the revolutionary impact of mechanization on restaurant operations, offering the possibility of boosting efficiency, enhancing service standards, and introducing fresh job roles within the workforce, hence H6 which states that 'The AI-supported automated restaurant services human-employees have a positive reaction toward robot-employees' is supported.

Nevertheless, the incorporation of robotic technology presents obstacles such as technical difficulties, adjustment barriers, and uncertainties regarding employment stability. Overcoming these obstacles necessitates meticulous strategizing, thorough education, and continuous assistance to facilitate a seamless shift and optimize the advantages of automated processes.

4.3.1.3 Training and Adaptation to Automation

This topic discusses the diverse types of education and guidance that employees receive to operate robotic systems. Analysis of responses 3 and 6 yielded valuable insights into the different forms of training and support available, such as training sessions conducted by manufacturers, firsthand training, management-led workshops, and peer mentoring. Furthermore, employees raised concerns regarding the obstacles and negative effects linked to adjusting to automation, such as technical difficulties and workplace changes. These results emphasize the critical need for thorough training schemes and continuous assistance to ensure seamless incorporation.

Adequate training and adjustment are vital for staff to effectively collaborate with robotic technologies. The information gathered from interviews shed light on the different training methods and support available, along with the obstacles and

disadvantages of acclimating to automation. Staff members recounted engaging in training sessions conducted by manufacturers, on-the-job training, participating in management-arranged workshops, and seeking advice from peers. Nevertheless, they voiced apprehensions regarding technical challenges, workplace changes, and the demanding learning process tied to automation.

Emphasizing the significance of thorough training schemes and continual assistance to streamline integration and guarantee the efficient operation of robotic technologies. Through allocating resources to training programs and offering staff the essential support and tools, those in the restaurant industry can enable their employees to adopt automation confidently and capitalize on its advantages.

4.3.1.4 Benefits, Drawbacks, and Improvements due to Robotic Systems

This topic delves into the comprehensive effects of automated systems in work environments, covering advantages, disadvantages, and anticipated enhancements. Answers provided in questions 5 and 8 emphasized the favourable results like heightened operational productivity, safety, and suggested modifications for enhancement hence H7 which states that 'The adoption of robotic services in restaurants leads to improved operational efficiency and reduced labour costs' is supported. Nevertheless, staff also expressed worries about downsides such as workplace decline and the necessity for improvements in automation. These observations highlight the intricate nature of assimilating robotic systems into restaurant functions and underscore the significance of tackling both advantages and obstacles.

The impact of robotic systems in the workplace is multifaceted, presenting advantages as well as disadvantages. Interview data highlighted various positive results, such as enhanced operational efficiency, safety measures, and desired enhancements. Employees noted how automation optimized processes, elevated service standards, and spurred innovation. Nonetheless, they also expressed reservations about workplace changes, technical hurdles, and the necessity for automation enhancements. This underscores the significance of addressing both the rewards and pitfalls of automation for a successful assimilation into restaurant operations. By pinpointing areas for refinement and deploying strategies to tackle challenges, stakeholders can

fully leverage robotic systems' potential and yield favourable outcomes for the restaurant sector.

To summarize, the thematic analysis offers significant findings regarding the assimilation procedure, staff interactions, and the implications of automation on restaurant functions. By comprehending the various job duties in a restaurant, evaluating the incorporation and consequences of automated systems, delving into training and adjustment to automation, and appraising the advantages, disadvantages, and enhancement of robotic technologies, stakeholders are empowered to make well-informed choices and adapt to the changing dynamics of the restaurant sector.

4.3.2 Relationship Between Themes

The analysis reveals interconnected themes that illustrate the complex integration process and its effects on restaurant operations. For example, the smooth implementation of robotic systems depends significantly on proper training and adjustment, which subsequently impact the roles and duties of the workforce. Moreover, the pros and cons of automation influence perceptions about its effects on work processes and services. Comprehending these connections offers valuable perspectives on the opportunities and challenges linked to incorporating robotic systems in the restaurant industry.

4.3.3 Reflections

The outcomes of this analysis yield substantial knowledge that is crucial for restaurant managers, policymakers, and scholars. Grasping the intricacies of incorporating automated systems into restaurant functions can guide strategic decision-making, training programs, and technological expenditures. Additionally, the themes identified contribute to larger conversations on automation, workforce interactions, and the future of employment within the restaurant industry. By tackling the obstacles and advantages linked with automation, stakeholders can enhance readiness for the changing dynamics of restaurant management.

In its entirety, this thematic examination offers an intricate comprehension of the assimilation process and its repercussions on the dining sector, adding value to

continuous research and pragmatic implementations in the realms of automation and workforce supervision.

CHAPTER V

CONCLUSION AND RECOMMENDATION

5.1 Summarized Findings

The study set out to accomplish five research objectives. We successfully erected extended and empirically evaluated a model for a cohort of customers and employees who possessed experience in Istanbul based restaurants offering robot services. Overall, this study endeavored to respond to five research questions.

5.1.1 Research Question 1

To address the first and second questions the study involved surveying customers directly. Concerning the first question, the perceptions of customers regarding the use of robotic services in restaurants and their impact on their levels of satisfaction and acceptance of such services are detailed. Notably, ease of use significantly influences usefulness and enjoyment which in turn affects experience satisfaction. While factors like diner type educational qualifications and gender weakly influence acceptance level customer age seems noninfluential.

5.1.2 Research Question 2

Moving to the second question, the impact of overall experience satisfaction on experience extension and adoption, experience satisfaction is revealed to strongly impact both extension and adoption showcasing a concrete influence on extending experiences as previously evidenced.

5.1.3 Research Question 3

To address the third and fourth questions a study was conducted through an interview session discussion. Regarding the third question, the perceptions of employees regarding collaborating with robots, and its influence on their level of job contentment. Employees generally hold positive views on collaborating with robots. They acknowledge that robotic systems enhance repetitive tasks streamline mundane

activities and allow the reallocation of human resources to more complex duties. Additionally, the introduction of automated systems is seen to positively influence work dynamics. These observations indicate that employees consider collaborating with robots as a way to enhance efficiency improve service standards and potentially introduce new job roles within the organization. Thematic analysis suggests that employees derive satisfaction from collaborating with robotic technologies enabling them to focus on more meaningful and intricate tasks rather than mundane ones. Overall, the integration of robotic systems into restaurant functions positively influences job contentment levels offering employees the chance to engage in more fulfilling work and potentially fostering empowerment and innovation in the workplace.

5.1.4 Research Question 4

When it comes to the fourth question, the advantages and disadvantages come with employing AI-driven service robots in restaurants. The introduction of AI-driven service robots in restaurants brings about a significant shift in operations offering a mix of benefits and hurdles. These robotic entities expedite activities such as delivering food items and managing dishwashing thereby boosting operational efficiency and upholding consistent service quality. Moreover, by automating repetitive responsibilities human staff members can dedicate their efforts towards more complex tasks nurturing skill advancement and creativity within the team. However, incorporating AI-driven robots might encounter technical issues and adaptation challenges consequently requiring thorough training and assistance for the workforce. Additionally concerns regarding job stability and the initial expenses involved in procuring and upkeeping these robots pose substantial obstacles. Despite these barriers, by addressing both the positives and negatives of deploying AI-driven service robots' restaurants can harness their capabilities to augment productivity service excellence and the overall dining experience.

5.1.5 Research Question 5

When discussing the fifth and last question we explore the benefits awaiting restaurant proprietors and managers seeking to elevate their establishments in this industry.

Initially the study uncovers valuable insights into how incorporating robotic technology impacts restaurant operations influencing efficiency services and work dynamics. By understanding these implications proprietors and managers can confidently decide on incorporating automation into their establishments. Furthermore, the study sheds light on the challenges associated with adopting robotic technology such as technical issues and adjustment hurdles. Recognizing these obstacles enables restaurant stakeholders to devise effective strategies like providing comprehensive training and ongoing support to staff. Additionally, the research points out the variety of educational resources and support systems offered to employees for handling robotic systems including training sessions workshops and peer mentoring. Utilizing this information restaurant proprietors and managers can create customized training programs that adequately prepare employees to operate with robotic technologies. Moreover, the study underscores the multifaceted impact of robotic systems.

5.2 Research Implications

Utilizing service robots within the hospitality sector particularly within dining establishments presents a plethora of implications intertwining theoretical musings with tangible applications that sculpt the- realm of customer interactions and operational paradigms.

5.2.1 Theoretical Implications

The research significantly enhances our understanding of service robots in hospitality, particularly in restaurants. It emphasizes the factors influencing employee and consumer satisfaction in robot operated establishments expanding the Technology Acceptance Model (TAM) with new critical variables relevant to robot acceptance. This broader theoretical landscape offers key insights into human robot interactions shaping customer experiences and operational efficiency in restaurant settings.

The exploration of consumer behaviour in the post COVID19 era focusing on the acceptance of service robots not only bridges critical gaps in existing literature but also sheds light on unexplored aspects of consumer behaviour. By examining the congruency between robot types and diner profiles this research enriches theoretical

frameworks associated with consumer evaluations of service robots in the pre-consumption stages.

5.2.2 Managerial Implications

From a practical standpoint the study outcomes not only provide tangible recommendations for restaurant operators and managers aiming to integrate or refine service robots in their premises but also delve into valuable insights. Factors such as perceived ease of use usefulness and the level of enjoyment derived from robot services offer profound guidance for shaping training modules and operational workflows to enhance employee constructive collaboration with service robots. Through tailored training initiatives and operational streamlining managers can facilitate seamless human robot interactions thereby maximizing operational efficiency and elevating customer satisfaction levels.

Furthermore the study highlights the crucial importance of addressing hygiene concerns and cultivating trust among customers regarding safety measures associated with robot operated restaurants. Implementing rigorous hygiene protocols and transparently communicating safety measures can alleviate customer apprehensions leading to enhanced intentions for revisits and recommendations. Moreover, the research emphasizes aligning robot types with diner preferences to optimize marketing benefits and mitigate financial costs of service robot adoption. Managers can tailor offerings based on visit frequency and entertainment value catering to diverse customer needs and preferences thus maximizing the return on investment in service robot technologies.

In conclusion when service robots join the party in restaurants they do not just bring theoretical advances; they also pack practical strategies to amp up customer experiences and operational efficiency. By spicing up their practical decision making with theoretical insights restaurant operators and managers effortlessly navigate the complexities of incorporating service robots. This positions them strongly in the fast-paced hospitality industry.

5.3 Research Contributions

The realm of hospitality has witnessed a notable trend in recent times with the emergence of service robots notably within dining establishments. This study embarks on an exploration of the profound effects of integrating service robots in restaurant settings dissecting these effects into theoretical implications and practical applications.

5.3.1 Theoretical Contributions

This research significantly contributes to theoretical advancements through several channels. Initially it expands the existing literature by shifting the focus from human robot interaction post consumption to the preconception phase. Exploring how the types of different robot influence consumer attitudes and behavioural intentions this study highlights the pivotal role of robot types in enhancing marketing effectiveness thereby enriching the hospitality marketing literature on robot innovations.

The study unveils an intriguing association between the type of robots and diner preferences offering a fresh perspective to the existing literature. While prior research has highlighted the advantages of humanoid service robots this work uncovers situations where nonhumanoid robots might actually be preferred especially by solo diners. By enhancing our understanding of how diners perceive different robot types based on their characteristics the study enriches the evolving literature on solo dining and human robot interaction.

Initially the research highlights the crucial role of anticipated psychological comfort as a driving force behind the congruence effect between robot type and diner type. This discovery resonates with recent studies that underscore the importance of expected psychological comfort in shaping consumer decision making processes. From a managerial standpoint the insights provided on aligning robot types with specific customer segments equip restaurant owners with practical approaches to enrich the dining experience.

5.3.2 Managerial Contributions

From a pragmatic perspective this study provides invaluable insights for marketing practitioners and service organizations. Initially it stresses the crucial aspect of

enhancing customer interactions with service robots. By conducting thorough market analysis and utilizing existing customer information service providers can customize service processes and dialogues to match customer expectations. This in turn enhances overall interaction quality and cultivates positive attitudes towards service robots.

Furthermore this study emphasizes the importance for service organizations to consider the service context when introducing service robots. By comprehending the moderating impact of service contexts such as limited and full service settings organizations can more accurately predict and deal with customer preferences and reactions toward service robots. This practical insight empowers service providers to develop more effective strategies for incorporating service robots into diverse hospitality environments including restaurants.

In conclusion this exploration elucidates the multifaceted contributions of service robots in the hospitality industry. It goes beyond mere theoretical progress offering practical strategies to elevate customer experiences and operational efficiency. By bridging theory and practical applications this study equips marketing practitioners and service organizations with invaluable knowledge to adeptly incorporate service robots into restaurant environments.

5.4 Limitations and Recommendations for Further Research

Even though this manuscript discusses both theoretical frameworks and practical applications we must recognize the constraints that the current study encountered indicating a call for a redefined approach in future investigations.

1. A cross-sectional design guided this examination potentially raising concerns regarding result bias causality and incidence. Consequently, upcoming researchers must explore customer satisfaction within robot operated dining establishments through longitudinal studies.
2. Developing the extended TAM model with limited sample sizes derived from an online questionnaire could present challenges for this study primarily due to constraints in generalization. It is advisable for future research endeavours to encompass a more diverse range of respondents for a comprehensive analysis. Considering the online questionnaire methodology it is essential to acknowledge potential biases towards certain technologies among respondents.

3. To address the study's questions we tested the hypotheses using a scenario-based approach and collected data via an online experimental design. The observed relationships can change as the contexts and study methods vary. After robots are widely adopted in many restaurants future studies may consider conducting field experiments with live robot customer interactions to capture customers' real time responses and add credibility to our findings.
4. This study was conducted solely in the Istanbul market. Nevertheless within the hospitality industry numerous global restaurant chains are contemplating the deployment of robots on a worldwide scale. Hence investigating the diverse perceptions of restaurant patrons based on their cultural disparities is poised to enhance the implications for bolstering the global operations of restaurants.
5. In the future you as a scholar should explore various backgrounds such as hotels cruise companies and convention centres to expand this study to other sectors within the hospitality industry. By examining different sectors you can better equip marketers to adopt a variety of robots effectively.
6. Personal experiences could add a vibrant touch to the situation. Here it is widely observed that children derive immense pleasure from interactions with robots. When parents join their children at a restaurant their responses could veer towards emotional or hedonic experiences. Exploring how children engage with robots might lead to profound implications for future research initiatives.
7. This exploration is centred around casual dining establishments. In future investigations it would be fascinating to investigate whether the nature of the dining venues (for example fast food chains casual eateries and upscale restaurants) influences the anticipated impacts. To illustrate patrons of fast-food establishments typically prioritize practicality and minimal social engagements with staff members. In contrast customers at casual or upscale restaurants often seek hedonistic experiences and expect substantial interactions with service providers. Considering that humanoid service robots are often perceived as sociable and amiable entities it is plausible that they are better suited for casual dining and upscale restaurants. Conversely nonhumanoid service robots may be more fitting for fast food establishments.

8. The study concentrated on the involvement of human employees in interactions with robotic service providers. Service organizations frequently struggle with maintaining the right equilibrium between AI-enhanced frontline agents such as service robots and human employees. An intriguing avenue for future research entails exploring how the balance between service robots and human workers may shift within full-service and limited-service contexts.

9. The study's outcomes indicate that older individuals typically experience lower satisfaction levels than younger ones emphasizing the need to enhance the elderly's satisfaction. The introduction of new technologies can revolutionize their experiences. However these technologies target the younger population due to healthcare and lifestyle advancements. The global elderly population is steadily increasing with the proportion of individuals aged sixty and above expected to rise from 12% in 2015 to 22% by 2050 (WHO 2021) highlighting the significance of the elderly as consumers. Older individuals often struggle with technology requiring assistance from family members to prevent errors. Implementing more user-friendly technology can enhance the happiness and independence of older consumers.

To sum up by overcoming these constraints and exploring the proposed paths for future investigation we can enhance our understanding of the implications of deploying service robots in the hospitality sector. This will enable us to make well-informed decisions and develop strategic plans for service organizations.

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APPENDICES

Appendix-A: QUESTIONNAIRE

Section I: The Introduction of The Questionnaire

Dear Participant,

Thank you for your eagerness to engage in our questionnaire, a fundamental component of our research endeavor named "Investigating the Influence of AI-Powered Robotic Services in Istanbul Dining Establishments: A Study on Improving Customer Satisfaction and Employee Engagement." Your insightful feedback as a patron is instrumental in shaping our comprehension of the effects of AI-driven robotic services on the restaurant experience.

Purpose of the Study:

The primary objective of this research is to investigate and evaluate the different aspects of customer contentment in eateries utilizing AI-powered robotic assistance. Your input will assist us in evaluating the efficiency of these innovations in meeting client anticipations, improving service standards, and ultimately, fostering an enhanced dining experience.

Confidentiality and Anonymity:

Your answers will be kept completely confidential, and your identity will be kept anonymous during the duration of the research. Please share your responses sincerely and considerately to the best of your capacity, as this will be highly beneficial for the advancement of our studies.

Questionnaire Instructions:

This questionnaire consists of five sections containing [number] inquiries that address various facets of your interactions with AI-powered robotic services in dining establishments. Your feedback is greatly appreciated, and we encourage you to share your thoughts openly.

We appreciate the time and effort you have dedicated to this endeavor. Your insights are invaluable and will greatly enhance the progress of research in this area.

Warm regards, Hebah QASIM.

Section II: Starting Question of the Questionnaire

1. Have you ever visited a restaurant that implement robots in Istanbul?
    - Yes, I visited restaurant that use robots for services.
    - No, I have not visited a robotic restaurant ever.
2. If you answer question 1 as yes, how frequently visited Robotic Restaurant?
    - One time
    - 2-4 Times
    - More than 4 Times

Section III: Demographics

Related to your own information, please answer the following questions, so we can learn more about you.

3. Age Group
    - Less than 20 years
    - Between 21 and 30 years
    - Between 31and 40 years
    - More than 41 years
4. Gender
    - Female
    - Male
5. Educational Qualification
    - Primary School
    - High School
    - Undergraduate School
    - Postgraduate School
6. Monthly Income
    - Lower than the minimum wage in Türkiye (20,000₺)
    - Between 20,001₺ and 40,000₺
    - Between 40,001₺ and 60,000₺
    - More than 60,001₺
7. Mode of Visiting the Robotic Restaurant
    - Solo
    - In Group

Section IV: Product Level Theory

Please read the following scenario carefully and answer the related questions.

Imagine that you received a valuable coupon that allowed you to enjoy the experience of various stages three different restaurants managed by service robots at various stages.

Restaurant 1: a classic restaurant, gives you the opportunity for a unique experience, as the robot is the one who prepares the food and cooks (core service).

(Garcia-Haro et al., 2021)

Restaurant 2: restaurant that is implementing robotics in food delivery, in addition to the smart services that manage ordering and payment processes, that is done using smart screens (facilitating service).

(Garcia-Haro et al., 2021)

Restaurant 3: restaurant that employs robots that make an interaction between customers, robots themselves, and the dining atmosphere, for example they are implemented for entertaining purposes (augmented service).

(Garcia-Haro et al., 2021)

8. Which one do you prefer?

- Restaurant one
- Restaurant two
- Restaurant three

9. Would you prefer dinning in the chosen restaurant alone, or with friends/family?

- Alone (solo diner)
- In a group

Section V: Technology Acceptance Model & The Overall Experience Satisfaction and Extension

Question Code	Statement	Key Answers				
		Strongly Dispute	Dispute	Neutral	Concur	Strongly Concur
	Technology Acceptance Model					
PU1	10. Service robots play a valuable role in the hospitality industry, particularly in restaurants, where they are adept at executing tasks that mirror those of human employees.					
PU2	11. Robots catering to my desires and preferences.					
PU3	12. The easiness of using robots make my usefulness level higher.					

PE1	13. Interacting with service robots gave me lots of pleasure, and it was fun.					
PE2	14. The Cutting-Edge Innovation of the New Restaurant Service Robot Brought Me Joy.					
PE3	15. The easiness of using robots make my enjoyment level higher.					
PEOU1	16. Utilizing the automated service robot did not necessitate a significant amount of cognitive exertion.					
PEOU2	17. The user-friendliness of robot surprised me.					
PEOU3	18. I found the service robot's interaction easy to understand.					
	Product Level Theory					
ES1	19. My overall experience was satisfactory.					
ES2	20. My overall experience was memorable.					
ES3	21. My overall experience was enjoyable and pleasant.					
EE1	22. I would share my experience, recommend encourage this robot service restaurant to others.					

EE2	23. I intend to share favourable opinions about this dining establishment on various social networking sites and actively support its services.					
EE3	24. I plan to revisit this automated restaurant experience.					

Appendix-B: INTERVIEW QUESTIONS

Section I: Employees' Interest Perspective

Q1: Can you briefly describe your role and responsibilities in the restaurant?

Q2: Have you engaged in direct interactions with service robots? If so, what is the duration of your collaboration with these automated systems?

Q3: Did you undergo any form of instruction or assistance concerning the operation of these automated systems?

Section II: Restaurants' Interest Perspective

Q4: How has collaboration between human employees and robotic systems affected the work dynamic and services?

Q5: Have you identified any benefits or improvements in the workplace due to the presence of robotic systems?

Q6: Have you identified any drawback or deteriorations in the workplace due to the presence of robotic systems?

Q7: In considering the future, how do you foresee the progression of robotic services within the restaurant sector?

Q8: Are there specific changes or improvements you would like to see in the integration of robotic systems?

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	Halal and Kosher Food Certificate
Languages	English: Advanced
	Turkish: Intermediate
	Arabic: Native
Skills	Industry Knowledge: Food Science, Food Engineering, Food Production, Food Hygiene
	Technical Skills: Microsoft Office Suite, HACCP
	Soft Skills: Communication, Problem-Solving, Teamwork, Leadership