jamk

Robotization in hotels

Hotel guests’ attitudes towards the use of robots in hotel services

Nikita Skachkov

Bachelor’s thesis
April 2024
Bachelor's Degree Programme in Tourism Management

jamk | Jyväskylän ammattikorkeakoulu
University of Applied Sciences

jamk

Description page

Skachkov, Nikita

Robotization in hotels, hotel guests' attitudes towards the use of robots in hotel services

Jyväskylä: Jamk University of Applied Sciences, April 2024, 56 pages

Degree Programme in Tourism Management. Bachelor's thesis.

Permission for open access publication: Yes

Language of publication: English

Abstract

This thesis investigated the impact of robotization on the hospitality industry, focusing on operational efficiency, customer experience, and technology acceptance. The thesis is aimed to identify how robotic services influence hotel operations and guest satisfaction, with objectives including the evaluation of operational benefits, guest perceptions, and the influences driving technology acceptance among hotel visitors.

Employing a quantitative methodology, the research utilized a structured questionnaire distributed to hotel guests with different levels of experiences of robotic services in hotels. The analysis was conducted using statistical tools to examine responses related to perceived usefulness and ease of use of robotic services.

The results showed that although robotization is seen as improving operational efficiency, its impact on customer experience is complex. This thesis emphasizes the need for a strategic approach to integrating robotic technologies, referring to the importance of operational efficiency and customer expectations in promoting a positive perception and acceptance of robotic services in the hotel industry.

In summary, the thesis highlights how robotization may revolutionize hotel operations and guest services, but also how carefully integrating robotic technology must be done. It implies that to promote a favorable view and acceptance of robotic services in the hotel industry, it is critical to address both operational efficiency and guest expectations.

Keywords

Robotization, Hotels, Customer Service,

jamk

Description page

Skachkov, Nikita

Robotization in hotels, hotel guests' attitudes towards the use of robots in hotel services

Jyväskylä: Jyväskylän ammattikorkeakoulu, huhtikuu 2024, 56 sivua

Degree Programme in Tourism Management. Bachelor's thesis.

Julkaisulupa avoimessa verkossa: Kyllä

Julkaisun kieli: Englanti

Tiivistelmä

Tämä opinnäytetyö selvitti robotisaation vaikutusta hotellialalla, keskittyen operatiiviseen tehokkuuteen, asiakaskokemukseen ja teknologian hyväksyntään. Tavoitteena oli tunnistaa, miten robotiikkapalvelut vaikuttavat hotellien toimintaan ja asiakastyytyväisyyteen, mukaan lukien operatiivisten hyötyjen arviointi, asiakkaiden käsitykset ja teknologian hyväksyntään vaikuttavat tekijät.

Kvantitatiivista menetelmää käyttäen tutkimuksessa hyödynnettiin strukturoitua kyselylomaketta, joka jaettiin hotellien asiakkaille tai potentiaalisille hotellien asiakkaille, joilla oli eri tasoisia kokemuksia robotiikkapalveluista. Analyysi suoritettiin tarkastelemalla vastauksia käyttäen tilastollisia työkaluja.

Tulokset osoittivat, että vaikka robotisaatio nähdään operatiivista tehokkuutta parantavana, sen vaikutus asiakaskokemukseen on monimutkainen. Opinnäytetyö korostaa strategisen lähestymistavan tarvetta robotiikkateknologioiden integroinnissa, viitaten operatiivisen tehokkuuden ja asiakasodotusten merkitykseen robotiikkapalveluiden myönteisen käsityksen ja hyväksynnän edistämisessä hotellialalla.

Yhteenvetona opinnäytetyö korostaa, miten robotisaatio voi mullistaa hotellien toiminnot ja asiakaspalvelun, mutta myös sitä, miten robotiikkateknologian huolellinen integrointi on tehtävä. Se kertoo, että robotiikkapalveluiden myönteisen näkemyksen ja hyväksynnän edistämiseksi hotellialalla on tärkeää käsitellä sekä operatiivista tehokkuutta että asiakasodotuksia.

Avainsanat

Robotisaatio, Hotellit, Asiakaspalvelu

Contents

Figures

Tables

1 Introduction

The thesis develops an understanding of robotization in the hotel industry, specifically focusing on how it affects operational effectiveness and guest experiences. The study is conducted through a survey that reviews hotel guests' perceptions of robot services, utilizing the Technology Acceptance Model (TAM) to analyze perceived usefulness and ease of use of robotic services. This methodological approach allows for a detailed examination of guests' attitudes towards robotization and their willingness to interact with robotic services during hotel stays.

Robots are being used in hotels to carry out a wide range of duties, from assisting customers with enquiries and requests to delivering room amenities and performing concierge services. Robotic technology is becoming commonplace in hotels, revolutionizing operations, and guest experiences. From check-in to checkout, robots are now integral to the hospitality industry's functioning. The first robotic concierge was introduced at Aloft Hotel in Cupertino, California, in the early 2000s. (Hotel Technology News, 2023**)**. Due to this continuous robotization trend, hotels have an exciting possibility to enhance customer satisfaction and increase service delivery. However, a crucial factor in determining whether robots are successfully embraced is how consumers will perceive and respond to this new technology. This thesis investigates how hotel guests would feel about robot service and how that could affect overall customer experience.

As Shin and Jeong (2020) also mention, an era of robotization has begun, drastically changing interactions with customers and hotel operational procedures at the intersection of technological innovation and hospitality services. Understanding hotel customers' opinions regarding the usage of robots in hotel services is essential to this transition. This thesis not only provides insight on how robots could improve the visitor experience, but it also raises questions and increases expectations that could influence how robotics will be used in hospitality in the future. Investigating how guests feel about service robots is essential because it has an immediate impact on how these technologies are adopted, used, and successful in improving service delivery, customizing visitor experiences, and increasing operational efficiency. This thesis explores this research subject to offer a thorough understanding of the dynamics of guest acceptance and the consequences for service design.

Understanding how customers respond to these mainly digital encounters is crucial for the hospitality business as robots increasingly become a part of the service system. Examining how robot service affects visitor experiences and preferences has enormous consequences for hotel managers, practitioners, and decision-makers because customer happiness has traditionally been a pillar of success in the hospitality industry. It is highlighted in Rahman's (2023) analysis of the hospitality sector that this industry is fundamentally service-oriented. Rahman points out the critical nature of customer satisfaction within the industry, highlighting that poor service often leads to complaints, negative reviews, and a reluctance among customers to return. This narrative underscores the significant impact that customer experiences can have on the success and reputation of businesses within the hospitality sector.

The emergence of service robots marks a significant change in the hotel sector since it may improve operational efficiency and redefine customer service standards. According to Tuomi, Tussyadiah, and Stienmetz (2020), integrating service robots not only holds potential for improving service delivery but also calls for an improved approach to strategic leadership and management. To take full advantage of robotization, it is essential to find a balance between addressing the economic and social implications and ensuring that technology improves rather than eliminates the human touch, which is fundamental to hospitality.

The larger context of this thesis lies at the intersection of technological innovation and hospitality services, amid a broader trend towards automation and digital transformation in the service industry. It explores how the introduction of robots into hotel operations represents a fundamental change, potentially redefining customer service standards and operational efficiencies. The thesis is set in an evolving hospitality landscape, where improving customer satisfaction through innovative technologies is increasingly becoming a strategic priority. The thesis contributes to a deeper understanding of how robotization could shape the future of hospitality, addressing both the opportunities it presents for enhancing the guest experience and the challenges it poses in terms of customer acceptance and service personalization.

2 Robotization

Robotization is the integration of robotic technology to improve operational efficiency and change guest experiences. It represents an important shift in the hospitality business. This chapter starts by breaking down the terms and ideas related to robotization, providing a foundation for further exploration of its use and effects in hotels.

2.1 Defining Robotics and Robotization

Robotics according to Merriam Webster dictionary is a “technology dealing with the design, construction, and operation of robots in automation”. A robot on the other hand is a programmable machine capable of autonomously or semi-autonomously performing tasks in the physical world. According to (Britannica, 2023) artificial intelligence significantly contributes to robotics, enabling robots to replicate human sensory functions such as sight, touch, and detecting temperatures. The focus of contemporary robotics research is on developing robots that possess autonomy to navigate and make decisions independently in dynamic environments. A number of these advanced robots have the capability to execute basic decision-making processes on their own.

Industrial and service robots are the two categories into which robots can be separated. Although there may be a few similarities between industrial and service robots, Galvis (2021) points out that their primary purposes are completely different. Industrial robots are typically used for dangerous work or manufacturing applications. Industrial robots frequently take the place of human workers in these positions. However, service robots are increasingly commonly used and can be found in a variety of industries, including cleaning, hospitality, healthcare, and other related ones. Service robots are designed to perform softer jobs compared to industrial robots, yet they can also be employed in manufacturing. The purpose of service robots is to support humans, not to completely replace them in the job.

Robotization, on the other hand, refers to the process of integrating robots or robotic systems into various industries. Cambridge dictionary defines robotization as “the act or process of introducing robots (= machines controlled by computers) to do work that was previously done by people” (Robotization, 2023) with the objective to either streamline tasks or enhance human skills, focusing on creating systems that can operate autonomously or in support of human efforts.

2.2 Development of robotization

The development of robots in the hospitality sector is a fascinating journey from traditional service delivery to the incorporation of modern technology. At first, the priority was on employing simple robots to automate repetitive jobs like room service deliveries and check-in and check-out procedures. But just as technology developed, so did robots' abilities in the hospitality sector. According to Shin (2022), the development of robotics in the hospitality sector underscores an important shift toward a more technologically sophisticated and networked service environment. The hospitality industry must effectively manage a multitude of opportunities and problems presented by this evolution if robotics is to fully improve service performance and client happiness.

Yang and Chew's (2020) study shows that, the induction of service humanoid robots into the hospitality sector represents a major advancement toward a more advanced and successful service model. Humanoid robots are expected to play a significant role in the future of hospitality services, despite the obstacles still present. These include the potential for better client experiences and efficiency in operations. With their human-like features and skills, humanoid robots are an amazing example of how technology and design can come together. Because these robots are designed to resemble human movements and interactions, they can be used in a wide range of applications.

2.3 Robotics in services

The application of robotics in service industries is a rapidly evolving trend. “The global service robotics market size was accounted at US$ 41 billion in 2022 and it is projected to surpass around US$ 169.50 billion by 2032 with a registered CAGR of 15.30% from 2023 to 2032.” (Service Robotics Market Size to Hit US$ 169.50 BN by 2032, n.d.). CAGR according to Investopedia means “The compound annual growth rate (CAGR) is the rate of return (RoR) that would be required for an investment to grow from its beginning balance to its ending balance, assuming the profits were reinvested at the end of each period of the investment’s life span.” (Fernando, 2023) In the context of services, robots are constructed to assist and improve customer experiences. In customer service, chatbots and virtual assistants are examples of service robots that handle inquiries and support customers as said by Rosete et al. (2020).

Service robotics.

Yasar and Hanna (2023) define service robotics as the field or the study of robots that are designed to assist humans and enhance their productivity in various service sectors. It involves the study, creation, and use of robots that cooperate with people to carry out tasks, frequently outside of an industrial environment.

“The International Organization for Standardization defines a “service robot” as a "robot in personal use or professional use that performs useful tasks for humans or equipment".” (IFR International Federation of Robotics, n.d.)

In conclusion the difference between service robots and service robotics is, that are the specific machines that carry out activities in service capacities, while service robotics is the larger subject that encompasses the creation and technology underlying the robots.

Lee (2021) conducted a systematic literature review where he found out that service robotics has a bright future ahead of it. These robots are getting smarter, quicker, and able to pick up knowledge from their surroundings. Service robots are expected to become ever more important as technology develops, particularly in industries trying to raise efficiency, reduce costs, and improve customers satisfaction. Their capacity to work in harmony with people, automate repetitive jobs, and provide excellent services makes them advantageous allies in today's service-oriented society. As researchers push technical advancements in relevant areas including artificial intelligence, hardware, and network technologies, Service robots are expected to have much more abilities in the future. In addition to the momentum for growth created by these technological advancements, because of COVID-19 the need for customer-facing service robots across a range of industries, including hospitality and healthcare increased a lot.

Robotic Process Automation

(What Is Robotic Process Automation (RPA)? | IBM, n.d.) says that robotic process automation (RPA) is a revolutionary approach for business processes that use software robots to automate re-

petitive tasks, including file processing and data entry. These digital agents ensure smooth integration with current systems by simulating human interactions with applications. RPA frees up human resources to work on more difficult tasks while increasing productivity, lowering errors, and saving money. Because of its adaptability to rule-based procedures, scalability, and integration potential, RPA is a useful tool for businesses looking to run more smoothly and effectively. The system offers audit trails for oversight, compliance assurance, and long-term, continuous improvement. Although like all technology RPA has its challenges, many times, companies underestimate and confuse the true costs of robotic process automation. Furthermore, RPA management turns out to be complex, posing significant difficulties for enterprises. RPA is frequently used as a temporary fix for serious issues, as opposed to addressing deeper flaws with basic systems as mentioned in (The Dark Side of Robotic Process Automation (RPA): Understanding Risks and Challenges With RPA, 2023)

2.4 Robotics in hotels

Robotics in the hospitality industry, particularly in hotels, has gained substantial attention. Robots are being utilized in various capacities. Intel (Intel, n.d.) highlights that service robots are increasingly utilized in hotels globally to enhance and personalize guest experiences. Upon arrival, guests are greeted by AI-powered interactive kiosks, and their luggage is transported to their rooms by service robots, streamlining the check-in process efficiently. Their personal concierge is a humanoid robot, and AMRs (Autonomous Mobile Robotics) provide room service as seen in Figure 1. These applications aim to streamline operations, improve efficiency, and offer a unique and engaging guest experience according to Oitzman (2021).

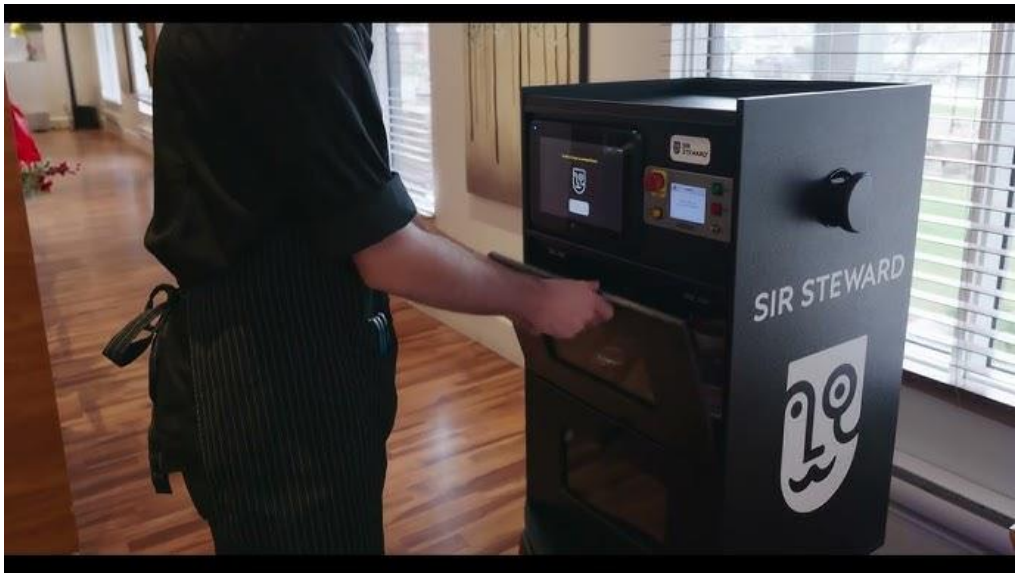


Figure 1. Sir Steward an autonomous mobile robot https://sirsteward.com/products/delivery-robot/

Case example Tokyo Ginza's Henn na Hotel

“One of the Japanese definitions of “henn” means “to change,” which represents the hotel’s commitment “for evolution in striving for the extraordinary sensation and comfort that lies beyond the ordinary.” (Henn-Na Hotel - Japanese Robot Hotel, n.d.). As the first hotel with operational robots, Guinness World Records has certified this fact. The Henn na Hotel uses a variety of cutting-edge technologies to provide a comfortable stay such as robot receptionists and automated services, a smartphone-connected smart remote control that keeps an eye on the room to ensure a comfortable stay, VR "Oculus Quest 2" as paid rental equipment and TrueSteam™ technology uses a constant temperature inside the cabinet to eliminate creases and unpleasant odors from clothing. Using the door's attached trousers hanger and crease care device, smooth out wrinkles on pants while keeping creases. (Hotel Features | Henn Na Hotel Tokyo Ginza, 2019). The hotel is rated 8,2/10 on Booking.com with 2069 reviews at the time of writing this thesis. (Henn na Hotel Tokyo Ginza, Booking.com)

The Henn-na Hotel in Nagasaki, Japan, guarantees visitors a wonderful stay with its staff of bilingual robots. Robots handle luggage delivery to the guest rooms and check-in. An English-speaking dinosaur robot is among the robots as seen in Figure 2. Robots make up the main crew, and you may interact with them. Human staff members are also available to guests around-the-clock in case an issue arises. (Henn-Na Hotel - Japanese Robot Hotel, n.d.-b)

Figure 2. Henn na Hotel reception, https://tokyo-ginza.hennnahotel.com/

2.5 Future trends in robotics

The future of robotics is dynamic and holds exciting possibilities. Some of the emerging trends include.

Advanced human-robot interaction. According to Spezialetti et al. (2020) future robots are expected to have more sophisticated interactions with humans. Robots will be able to comprehend and respond to human emotions and needs more effectively thanks to natural language processing and emotional recognition skills. (European Comission, 2022) made a 129 € million budget available for projects which goal is to improve human-robot connection by going beyond the limits of what is currently possible. This development seeks to improve the results of complex jobs and provide real value, particularly in the service sector. The emphasis is on jobs where human talents

can be enhanced by robotic capabilities, resulting in a synergy that needs continuous human involvement for best results. Although the communication requirements for such tasks vary depending on the particulars of the activity, they all essentially need lengthy and close cooperation between people and robots. This is applicable to several situations, including high-level service assignments that are customized for the hotel sector.

Smart room assistants the upcoming wave of hospitality technology is illustrated by smart room assistants, which turn ordinary hotel rooms into responsive, intelligent environments. These voice-activated, AI-powered assistants make tailored suggestions and automatically customize rooms according to visitor preferences. They serve as virtual concierges, providing immediate information, streamlining the check-in and check-out procedures, and guaranteeing contactless services. These assistants, which are integrated with visitors' gadgets, put security and privacy first, making for a smooth and productive stay. As centers of entertainment, they enable the distribution of content and offer service notifications, transforming the visitor experience through user-friendly, customized, and safe features as mentioned by Wadhwa (2023). According to (Hotel Technology News, 2018) various hotel brands are employing distinct approaches and cutting-edge technologies to realize the vision of the future guestroom. It has been stated that Marriott, Legrand, and Samsung are working together to develop a smart room where all the electronics react to voice command.

Integration with smart devices is one of the future trends and Hilton is also now working on a smart room that will use visitors' smartphones to communicate with various equipment in the space in an integrated way. (Here’s How Hilton Worldwide Is Using the Internet of Things to Create a Truly Connected Travel Experience, 2019)

These future trends in robotics have the potential to further transform industries, including the hotel sector. They hold the promise of more efficient operations, improved customer service, and a unique and innovative guest experience.

3 Customer Experience

This chapter explores the significance of customer experience (CX) in the hotel sector, emphasizing the role that CX plays in hotels' efforts to maintain loyal and satisfied customers. This section examines techniques for improving visitor interactions through technology and individualized service, as well as how CX affects a hotel's bottom line. Understanding customer experience (CX) is essential for adjusting to evolving visitor demands and laying the groundwork for successive conversations about enhancing hotel amenities and consumer happiness.

3.1 Defining customer experience (CX)

Customer experience (CX) encompasses the entirety of a customer's interactions and moments of engagement with a brand, product, or service, from the beginning to the end of their journey. Customer Experience (CX) is a term that refers to all the activities that a business does to give its customers outstanding experiences, value additions, and opportunities for development. This makes CX an important term in today's business world. The idea that the quality-of-service delivery today equals or exceeds the past focus on the goods and services provided by businesses emphasizes the significance of this. ("What Is CX," 2022).

In the hotel industry, the primary goal should be guest satisfaction as Kandampully and Suhartanto (2003) explain, not only is a pleasant stay important, but also providing an experience that encourages visitors to return. Making sure that visitors are satisfied is not only a wise strategy for hotels, but it also helps them stand out from the competition. Hotels that put a high priority on visitor satisfaction have a distinct atmosphere that draws attention.

According to Worsfold et al. (2016) everyone inside benefits as well; it's not just about the visitors. A satisfied customer is like a reward for the hotel staff. They understand that their effort counts, which improves the efficiency of the entire process and boosts employee morale. Keeping up with what guests want is essential to keeping them pleased in our ever-changing world. It's like remaining trendy and modern. In addition to keeping customers happy, hotels that use this improve every aspect of the stay, from room service to check-in.

3.2 Customer Expectations

Customer expectations in the context of hotels are complicated. They involve the basic needs of a comfortable room, a clean environment, and courteous staff. However, in today's competitive market, guests also have higher-level expectations. These might include personalized services, unique experiences, and a seamless and convenient stay. Meeting and exceeding these expectations are essential for ensuring guest satisfaction and loyalty. Therefore, understanding and managing customer expectations is a key component of providing exceptional customer experiences in the hotel industry. Operto (2023) explains that because hotels are marketed through the same channels, travelers are more interested in three essential features than in the type of lodging they stay at: convenience, autonomy, and personalization. However, as client demands shift and hotels are under pressure to provide more, it's becoming more difficult than ever to satisfy their wants due to the labor crisis in the hospitality industry.

By exploring the components of perceived usefulness and perceived ease of use within the context of robot service, this thesis aims to provide insight on the factors influencing customer attitudes towards this innovative service delivery method. Moreover, this thesis seeks to contribute valuable insights into human-robot interaction, and customer behavior. As mechanization continues to reshape various industries, including hospitality, understanding how users of robot service interact with them and how they accept it establishes the way for a seamless integration of technology and human interactions. (The Rise of Service Robots in the Hospitality Industry: Some Actionable Insights | Boston Hospitality Review, 2021)

The significance of this thesis extends beyond the academic world because it will help guide strategic decisions in the hotel business. As Xu et al. (2020) mention, hotel managers are better equipped to modify their technological strategies and match them with guest expectations by understanding the benefits and downsides of robot service from the client's point of view.

4 User acceptance and adoption of new technologies

This chapter will analyze the elements that affect visitors' readiness to accept new technology solutions provided by hotels by using the Technology Acceptance Model (TAM) as a fundamental framework. Using this perspective, it can be investigated how perceived usefulness and ease of use influence acceptance and how these factors might be improved to create a more hospitable atmosphere for technology innovations in the hospitality industry.

4.1 Acceptance Model (TAM)

The Technology Acceptance Model (TAM) as seen in Figure 3, is the chosen theoretical framework for this thesis, as it provides a well-established and comprehensive way to understand users' acceptance and adoption of new technologies.

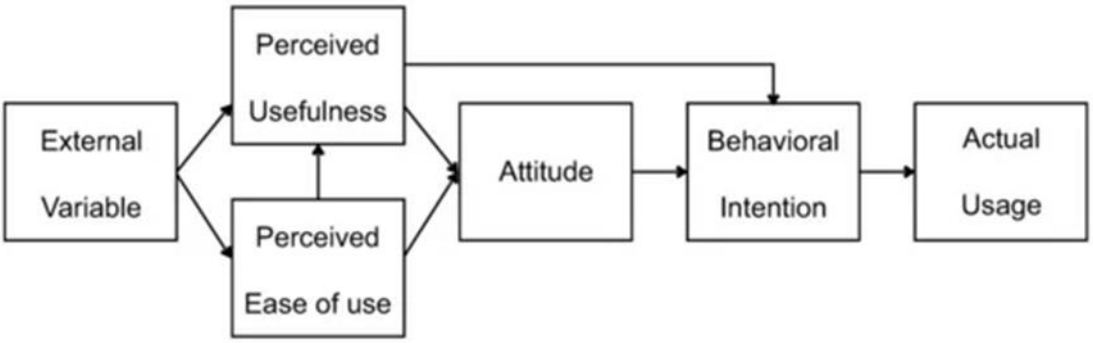


Figure 3. Technology Acceptance Model (TAM) by Davis (1989).

"Technology Acceptance Model (TAM; Davis, 1989) has been one of the most influential models of technology acceptance, with two primary factors influencing an individual's intention to use new technology: perceived ease of use and perceived usefulness." (De Camargo Fiorini et al., 2018, pp. 112129). The term TAM was first used by Fred Davis in the 1980s, TAM posits that individuals' attitudes towards technology usage are impacted by two main elements: perceived usefulness (PU) and perceived ease of use (PEOU). As Charness and Boot (2016**)** point out. (TAM) as a guiding theoretical framework. TAM, developed by Fred Davis in the 1980s, has proven instrumental in explaining users' acceptance and adoption of new technologies.

4.2 Perceived Usefulness (PU)

The degree to which people think a certain technology will improve their ability to execute their jobs or make their tasks simpler and more effective is known as perceived usefulness. In the context of this thesis. Ho et al. (2016) mentioned that Perceived Usefulness (PU), is a unique concept in the Technology Acceptance Model (TAM), it assesses the degree to which an individual thinks that utilizing a specific technique could help them to complete their work more successfully. PU will be central to understanding how customers perceive robot service in hotels. Customers' opinions about how well robot interactions meet their wants and enhance their overall hotel experience will be a key factor in determining how they will feel about this innovative service method.

4.3 Perceived Ease of Use (PEOU)

Perceived ease of use influences people's opinions about how simple it is to pick up and operate the technology. In the context of robot service in hotels, PEOU will explore guests' perceptions of the simplicity of interacting with robots. Ease of use is expected to influence customers comfort levels and readiness to embrace robot focused interactions. Worthington (2021) explains that perceived ease of use refers to how effortlessly an individual believes they can use a specific technology. People are more likely to intend to utilize a technology if they believe it to be user-friendly. This relationship points out the importance of designing technologies that users find intuitive and straightforward.

Attitudes Towards Robot Service

The TAM indicates that the link between consumers' true usage habits and perceived usefulness and simplicity of use is influenced by their attitudes towards technology. (Marikyan, D. & Papagiannidis, S. 2023) In the context of this thesis, customer attitudes towards robot service will be a critical factor in understanding their acceptance and willingness to engage with robot focused interactions during their hotel stay.

In investigating the dynamics of technology acceptance, it's critical to recognize the influence of demographic factors on perceived usefulness and ease of use, two central constructs of the Tech-

nology Acceptance Model (TAM). According to a Tuomi et al. (2020) study on digital cultural tourism, these factors have a major impact on older individuals' willingness to use digital services, highlighting the significance of accessibility and user-friendly design. This realization is especially important to the research on robotization in hotels because it highlights the necessity for inclusive technology design that accommodates visitors of all ages and makes sure that a wide range of hotel visitors view robotic services as both practical and simple to use.

Acceptance and Customer Satisfaction

As was pointed out in the introduction to this thesis the theoretical framework will study the link between customers attitudes towards robot service and their acceptance or rejection of robot interactions during their hotel experience. Also, the study aims to explore the impact of robot service acceptance on overall customer satisfaction. It is expected that positive attitudes and higher acceptance of robot service will relate with increased customer satisfaction, while negative approaches may lead to a lower satisfaction level.

5 Implementation

5.1 Research Method

The research methods employed in this thesis is quantitative, focusing on gathering numerical data to analyze customer perceptions and satisfaction with robot service in hotels. This approach is chosen to achieve the thesis objectives of understanding the occurring situation, evaluating customer perceptions, and determining the impact on customer satisfaction.

In the social sciences, the quantitative method serves as the main research framework, involving specific approaches and techniques to explore numerical patterns. This method enables a range of statistical analyses, simplifying data organization, pattern recognition, and comparisons across gathered data points. Quantitative research includes methods like surveys and experiments. (University of Texas at Arlington, 2023)

The choice of a quantitative research approach is reasonable by its ability to provide measurable understandings into customer perceptions. It allows for the examination of trends of findings

across a larger population of potential hotel guests. The structured questionnaire survey ensures consistency and comparison of responses, assisting data analysis and drawing meaningful conclusions.

The design of the survey, incorporating Likert-scale items, demographic inquiries, and open-ended questions, was selected to fully capture guest perspectives on the integration of robotics in hotel services. McLeod (2023) describes the Likert scale as a rating method with five or seven points, allowing participants to express how much they agree or disagree with particular statements, thereby facilitating a complex understanding of their views. Participants can convey their level of agreement or disagreement with a statement or question using the range of options provided by the Likert scale, typically ranging from positive to negative responses.

The survey was carefully developed to collect numerical data that matched the theoretical ideas covered in the thesis. The choice of survey questions was driven by the need to assess the perceived usefulness and ease of use of robotization in hotel services — key factors identified by the Technology Acceptance Model (TAM) as influencing user acceptance and adoption of new technologies.

Each question was crafted to extract specific information that would enable the evaluation of these concepts among hotel guests. For example:

One of the questions on Perceived Usefulness is "How would you rate the usefulness of robotization in hotels for improving service efficiency?" The purpose of this question is to directly measure the respondents' opinions regarding the usefulness of robotization, which is a fundamental component of perceived usefulness in the TAM framework.

A question on Perceived Ease of Use is "On a scale of 1 (Very difficult) to 5 (Very easy), how easy do you think it would be to interact with robots in hotels?" The perceived ease of use is directly influenced by the respondents' perceptions of the effort needed to engage with robots, which are measured by this question.

The inclusion of demographic questions about gender, age, and the frequency of hotel stays allowed for the identification of distinct acceptance patterns across different guest segments, potentially influencing the design and implementation of robotic services in hotels.

To capture the more challenging opinions and experiences of the respondents, open-ended questions were included, allowing for qualitative insights that provide depth to the quantitative findings.

5.2 Collection and description of data

To gather data, a structured questionnaire was created to people of all ages and cultures to gather the perceptions of people about usage of robotics in hotel services.

The respondents' demographic distribution was purposefully wide, including people of all ages because all age groups are possible hotel guests. This strategy makes sure that a broad range of viewpoints on the application of robotization in hotel services are captured in the survey, which is essential for figuring out how widely such technology is accepted.

Target Population and Sample Selection Criteria

The foundation of this thesis on the robotization in hotels, analyzed through the lens of the Technology Acceptance Model (TAM). These components are vital for ensuring the research accurately captures and reflects the perceptions and behaviors of people who are most important to the hotel industry's acceptance of robotic services.

Target Population

The study's target population includes those who have either dealt with robotic services in hotels directly or who may do so in the future. This encompasses a wide range of individuals with varying ages, ethnicities, and technological backgrounds in the hospitality industry. The study literature that highlights the significance of inclusiveness in comprehending technology acceptability across

various demographic segments Warschauer (2003) strengthens the justification for this wide target market. The study's broad demographic coverage attempts to provide a full picture of the differing attitudes and levels of acceptability regarding robotization in hotels, reflecting the substantial range of customers that the hospitality sector caters to.

Sample Selection Criteria

There were no clear criteria for the survey as the selection process was broadened to include those who indicate an interest to discover the latest innovations in the hospitality sector, which is consistent with the thesis goal of determining how prospective users see robotization. It is possible to explore expectations and prospective receptiveness towards new services by including people who are interested in future technologies. This provides insights into how developing technologies might be accepted by tomorrow's hotel guests.

Collection:

Social Media Networks

The poll was distributed on social media sites like Instagram and Facebook through author’s account to a potential audience of 350 people. These websites were chosen because of their large user base and capacity to reach demographics with interests in technology and tourism. By offering to contribute to important research that could influence future hotel experiences, participants were enticed to complete the survey.

WhatsApp

The survey was shared via WhatsApp to a group of tourism management students in a group chat, which consists of 38 diverse individuals who are potential future professionals in the hospitality sector.

Personal Networks

It was also distributed to friends and family, broadening the scope to include a more personal perspective and to capture the views of people who might not be reached through the above-mentioned formal channels.

To motivate participation, respondents were informed of the survey's academic importance and the potential impact of their contributions on the future of hotel services. These methods ensured a high level of engagement and a diverse set of responses, providing a solid foundation for analyzing the acceptance of robotization in hotel services.

5.3 Structure of Questionnaire

Introduction

It was explained that this thesis is aiming to explore hotel guests' attitudes towards the use of robots in hotel services, encompassing both physical service robots and software robotics like technology-assisted self-service systems. Participation in the survey is anonymous, voluntary, and confidential and that the responses will only be used for academic purposes within the thesis framework, and there's no possibility of tracing answers back to respondents. The introduction invites participants to contribute their insights to enhance understanding of guest perceptions and preferences regarding robotic integration in hotel services, offering contact information for inquiries or further details. It also notes the survey will take 5-10 minutes to complete and mentions the closing date as February 14, 2024. Full questionnaire can be found in the Appendices section.

Demographic Questions

To classify responses by age, gender, and nationality to analyze differences in perceptions across various groups.

TAM-related Questions

Perceived Usefulness (PU). The degree to which an individual thinks using robot services in hotels would increase their level of efficiency or enjoyment.

Perceived Ease of Use (PEOU). How simple and intuitive respondents find the robot services to be.

Attitudes Towards Using Technology. General feelings about using robot services in a hotel setting.

Behavioral Intention. The chances of individuals to use robot services in the future based on their perceptions.

5.4 Analysis of data

The analysis of the survey data was conducted using the statistical tools available in Webropol. This platform was chosen for its comprehensive set of analysis features, which helped an efficient and accurate examination of the responses collected from participants.

Using Webropol's statistical functions, the author was able to perform detailed analysis directly on the collected data. This included generating descriptive statistics to summarize the data set, such as calculating averages, medians, and mode for quantitative responses. The platform's capabilities also allowed for the analysis of variance among different demographic groups.

6 Results

6.1 Respondent Demographics and General Technology Usage

The questionnaire had 89 respondents, showcasing a diverse age range, with a significant portion between 18-24 years, showing a slight tilt towards a younger demographic as seen in Figure 4. This demographic might be more inclined towards technology use, potentially influencing their openness to robotics in hotels. The frequency of hotel stays indicates varied travel habits, which could affect familiarity and comfort with hotel technologies, including robotics.

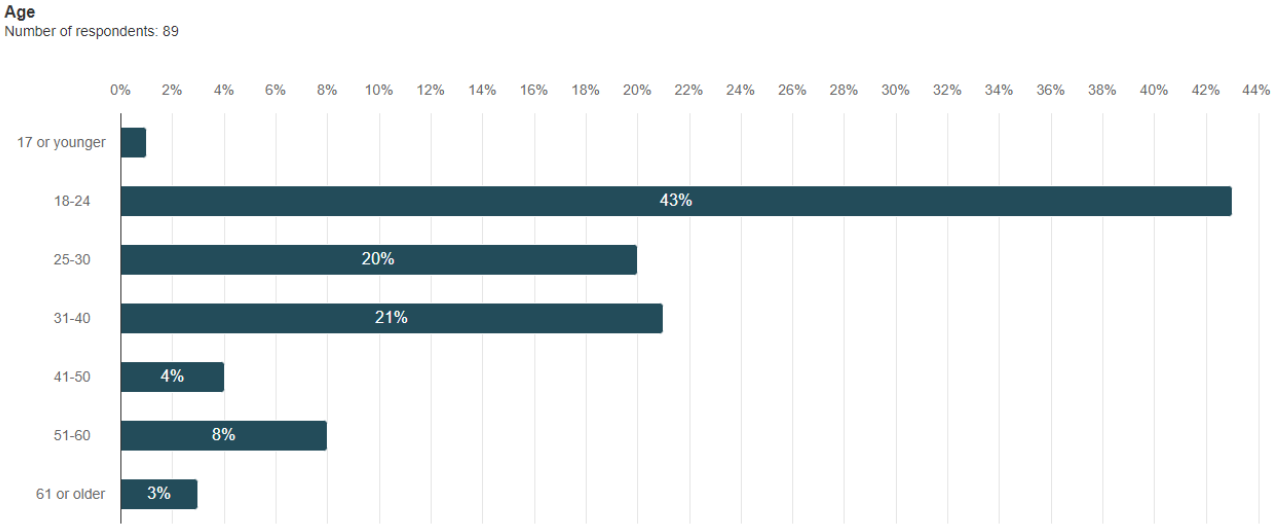


Figure 4. Age of respondents

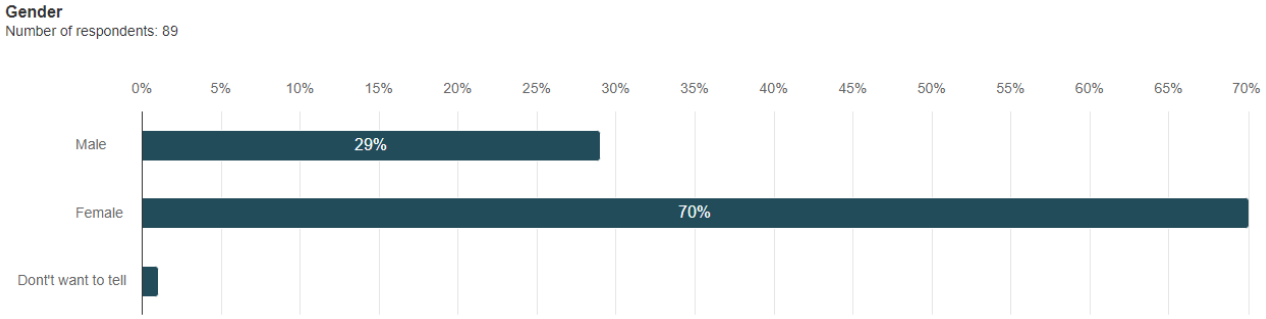


Figure 5. Gender

Most respondents are Finnish as seen in Table 1, providing a culturally specific viewpoint on the technology's acceptance in hotels.

Table 1. Nationality spread

Nationality
Number of respondents: 88

British	2	2,3%
Finnish	77	87,5%
Russian	7	7,9%
Spanish	2	2,3%

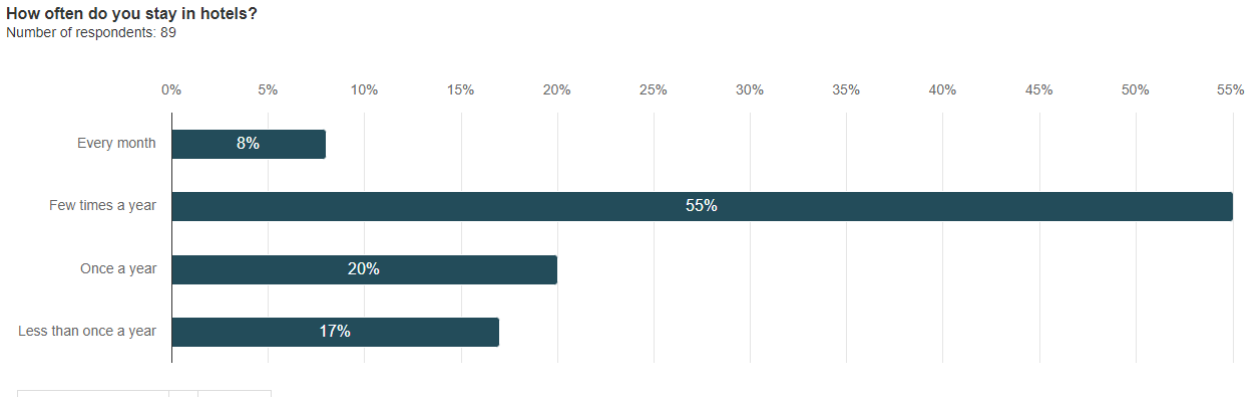


Figure 6. Hotel usage

Technology usage

The high technology acceptance rate indicated by all respondents using mobile phones/smartphones and a significant number using laptops/desktop as seen in Figure 7 and Figure 8 suggests not only a general familiarity and comfort with digital services but also points towards a digitally integrated lifestyle among the participants. The respondents' extensive usage of technology indicates that they rely on digital services for a variety of everyday tasks and are both used to and comfortable with them.

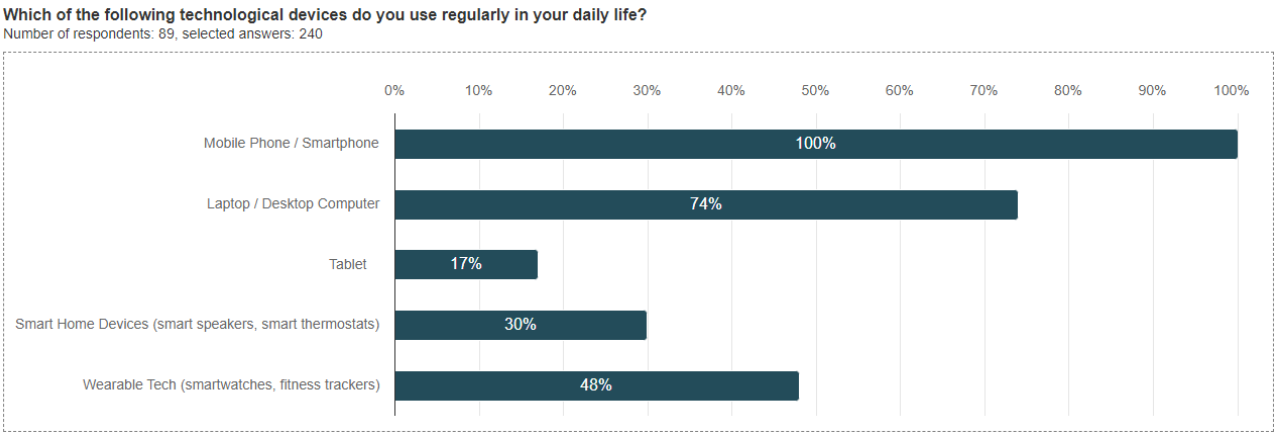


Figure 7. Technological device usage

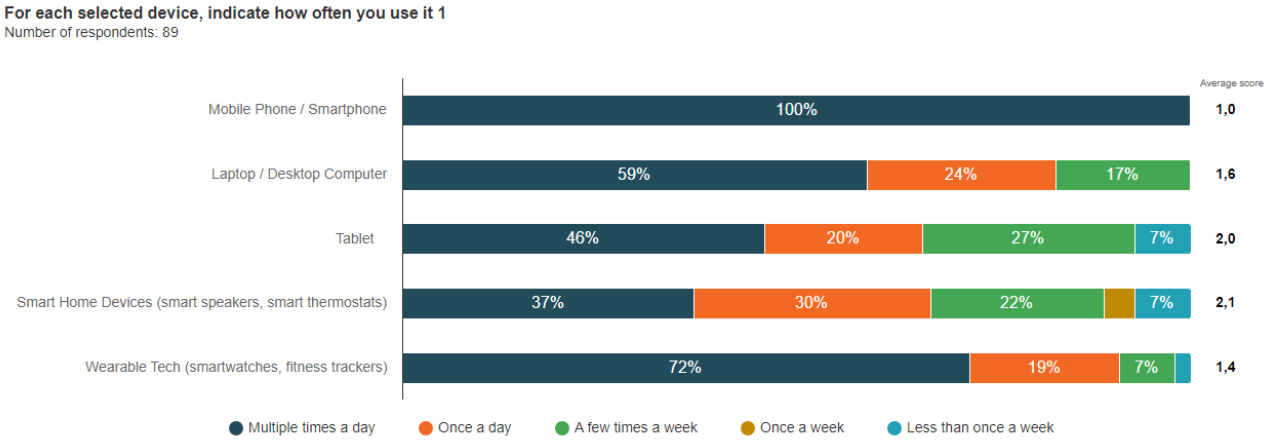


Figure 8. Use of the Technological devices

Awareness of Robots in the Hotel Industry

The average awareness score points towards a moderate level of familiarity with the concept of hotel robotization as seen in Table 2. This suggests that while many are aware of robotization in hotels, there's still significant room for increasing awareness and understanding.

Table 2. Awarness of robots in hospitality

On a scale of 1 (Not aware at all) to 5 (Very aware), how aware are you of the use of robots in the hotel industry?
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	2,3	2,0	206,0	1,0

6.2 Preference for Human Interaction

A significant majority of respondents prefer human interaction over robots for hotel services as seen in Figure 9, indicating the importance of personal touch in the hospitality industry.

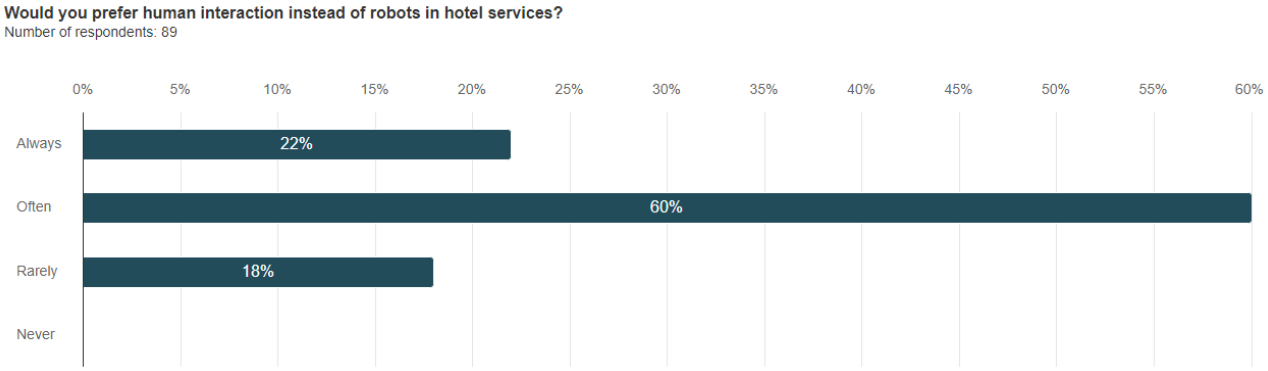


Figure 9. Preference for human interaction

6.3 Perceived Usefulness for Service Efficiency and Guest Experience

Respondents generally rated robotization as useful for improving service efficiency, showcasing a recognition of the operational benefits robotic services can offer as the Table 3 shows.

Table 3. Robotization improving service efficiency

How would you rate the usefulness of robotization in hotels for improving service efficiency?
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	3,5	4,0	310,0	0,9

The average rating for the usefulness of robotization in enhancing guest experience is however slightly lower than for service efficiency, suggesting a more complicated view on how robotization impacts the overall guest experience as seen in Table 4.

Table 4. Robotization improving guest experience

How would you rate the usefulness of robotization in improving guest experience?
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	2,8	3,0	245,0	1,0

6.4 Perceived Usefulness of Robotization for Specific Hotel Tasks

Check-In

The average rating for the usefulness of robotization in the check-in process is high at 4.1 as seen in Table 5. This suggests that guests see considerable value in automating this initial interaction.

Table 5. Check-in Usefulness

On a scale of 1 (Not useful at all) to 5 (Extremely useful), how useful do you find robotization in hotels for specific tasks?
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	4,1	4,0	367,0	1,0

Information Gathering

For information gathering, the average usefulness rating is 3.8 as seen in Table 6. This indicates a positive perception of robotic services in providing information, such as hotel amenities, local attractions, or dining options.

Table 6. Information Gathering Usefulness

Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	3,8	4,0	336,0	1,1

Room Service

The usefulness of robotization for room service receives a lower average rating of 3.1 as seen in Table 7. This indicates a more moderate perception of the benefits of using robots for delivering room service.

Table 7. Room Service Usefulness

Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	3,1	3,0	273,0	1,1

6.5 Experience with Robotic Services

Less than half of the respondents have stayed in hotels where they were served using robotics as seen in Figure 10, indicating that for many, their perceptions may be based on theoretical understanding rather than direct experience.

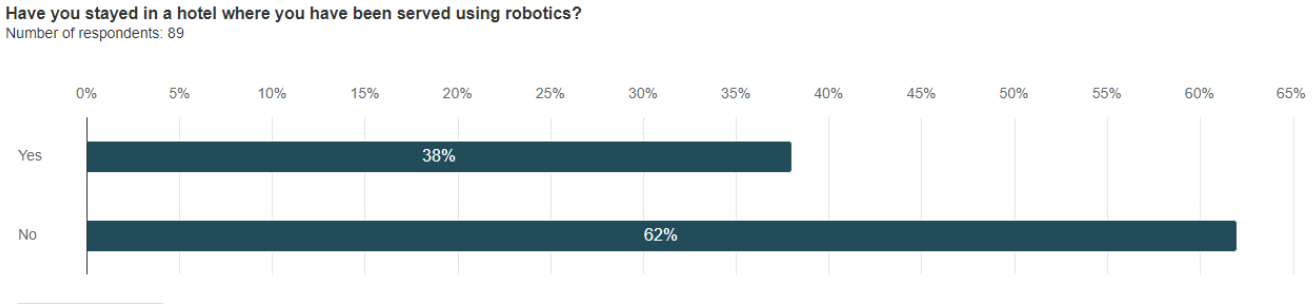


Figure 10. Experience with Robotics in Hotel

6.6 Perceived Advantages and Disadvantages

The survey data indicates a complex perspective on the advantages and disadvantages of robotization in the hotel industry, exposing a balanced understanding among respondents of the potential benefits and concerns associated with these technologies.

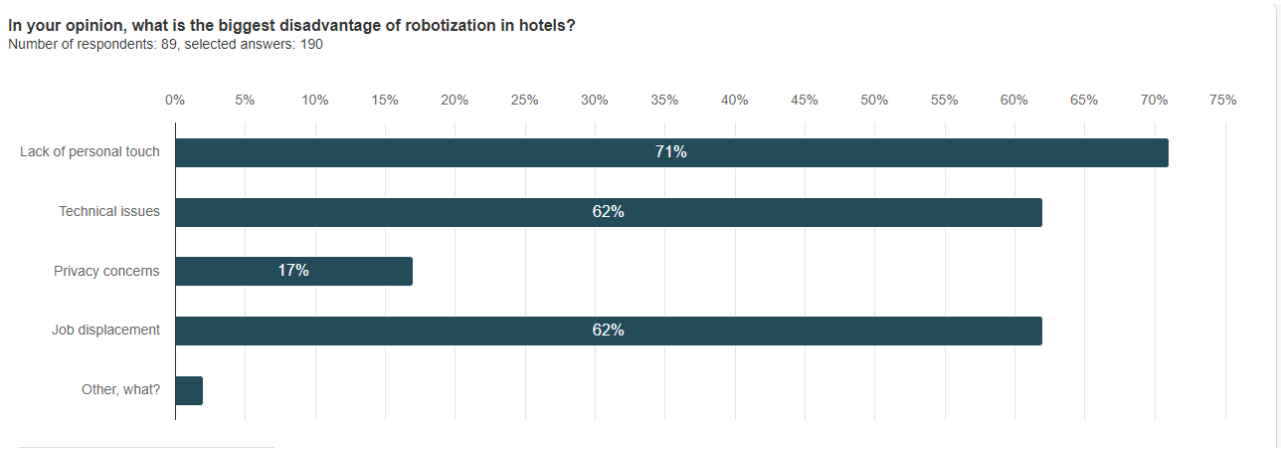


Figure 11. Disadvantages of Robotization

Participants in the survey frequently brought up the worry about decreasing warmth and human connection, which are essential components of the hospitality experience. This concern is centered on the idea that using robots might diminish the warmth and emotional connection that are often associated with human interactions in the hospitality industry.

The reliability of robotic services and the possibility of technological issues have drawn concern. This highlights the necessity of solid structures and effective methods for problem solving to guarantee smooth service delivery and preserve confidence in robotic solutions in service environments.

Concerns about data security and privacy related to the usage of robots were raised by a few respondents, highlighting the need for safe systems and clear data management procedures to protect private data in robotic interactions.

Some of the respondents are concerned about possible job losses and the undervaluing of human abilities because of the adoption of robotics in the hospitality business. This reflects concerns about how automation could change the structure of the workforce and how much value is placed on connections between individuals in the industry.

Some of the respondents also mentioned they have concerns about trust issues when it comes to relying on a robot to do the housekeeping in the rooms.

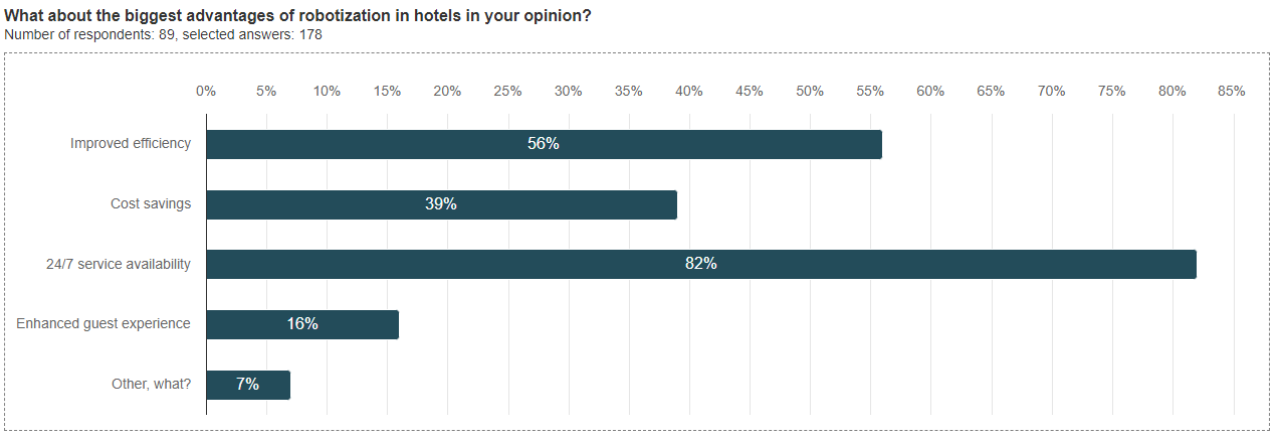


Figure 12. Advantages of Robotization

The study's participants recognized the benefits of robotic services in improving operational efficiency, particularly in terms of faster check-in and check-out procedures and prompt service delivery. The recognition serves as more evidence of the benefits robots may bring to expediting hotel operations and raising service levels overall.

One of the main advantages of robotic services is that they are available 24/7. This means that visitors may always use specific hotel facilities and services, which improves guest support's responsiveness and convenience.

Robots are appreciated for their ability to minimize human mistake, provide consistent service throughout all contacts, and guarantee that each visitor receives the same level of attention. One of the main benefits of robotic services in the hotel industry is their constancy.

Some participants acknowledge the possibility of robots providing more customized services. Robotic systems may be able to customize their services to each individual guest's tastes by using data analytics, which would improve the personalized experience that hotels provide.

Some of the other advantages respondents mentioned were, the ability to avoid human contact as it’s not easy for everyone to be in social situations.

6.7 Perceived Ease of Use of Robotic Services

Median of 3 indicates a moderate level of ease perceived by the respondents overall as seen in Table 8. The average slightly above the midpoint suggests that several respondents find interacting with robots in hotels to be reasonably straightforward. Meaning there is a diverse set of opinions on the ease of use.

Table 8. Interaction ease of use

On a scale of 1 (Very difficult) to 5 (Very easy), how easy do you think it would be to interact with robots in hotels?
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	3,3	3,0	293,0	1,0

Survey results indicate that respondents average a score of 3.0 when considering their comfort with robotic services in hotels as seen in Table 9. This suggests a medium level of comfort overall.

Such findings reveal neither a strong discomfort nor asserted comfort, implying a cautious yet open attitude among hotel guests towards engaging with robotic services.

Table 9. Comfort while interacting with robots

How comfortable would you feel interacting with robots for hotel services? (1 = Very uncomfortable, 5 = Very comfortable)
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	3,0	3,0	271,0	1,1

6.8 Attitudes and expectations Towards Robotization in the Hotel Industry

The data reveals a median score of 3.0 out of a possible 5 as seen in Table 10, indicating a neutral stance overall among respondents. This suggests that guests are cautiously open to the concept of fully robotized hotels. Implying differing levels of enthusiasm and reservations among the guests.

Table 10. Openness of customers

How open are you to staying in a fully robotized hotel?
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	3,0	3,0	268,0	1,2

The results reveal a strong belief among guests that robotization will become more prevalent in the hospitality sector, with an average response of 4.3 as seen in Table 11.

Table 11. Expectations for robotization

Do you think robotization in hotels will become more common in the next 10 years?
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
2,0	5,0	4,3	5,0	380,0	0,9

The average score is 2.9, which is just below the midpoint of the scale as seen in Table 12. This suggests a slight leaning towards the lower end of the likelihood scale, meaning on average, respondents are somewhat unlikely to choose robotized services in the future. There is some openness to using robotized services in the future, there is not a strong inclination towards them.

Table 12. Robotized service openness

How likely are you to choose robotized services in the future?
Number of respondents: 89

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	5,0	2,9	3,0	258,0	0,9

From these results, we can infer that there is a general leaning towards a positive reception of innovative technologies in hotels. However, there is still a notable portion of guests who are either unsure or leaning against the use of such technologies as seen in Figure 13.

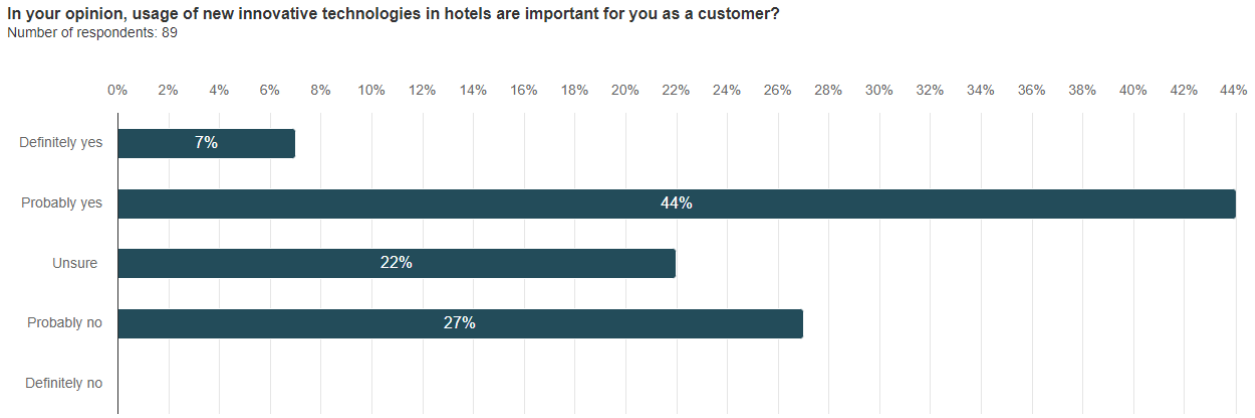


Figure 13. Importance of Innovations in Hotels

7 Discussion

7.1 Reliability

The systematic technique used in the data collecting and analysis is a crucial component that supports the reliability of this thesis.

The data gathered is guaranteed to be directly related to the goals of the thesis using a structured questionnaire. This method reduces answer confusion and improves the accuracy of the data gathered, which strengthens the validity of the conclusions.

Using Webropol to collect and analyze data provides a standardized platform that guarantees consistency in the way responses are obtained and examined. Because of the platform's built-in statistical capabilities, data analysis can be done accurately and mistakes in calculation by hand are eliminated from the results.

To find and fix any problems with the questionnaire, a test run was carried out before the survey was fully implemented. By doing this step, the reliability of the thesis was further increased by ensuring that the data collecting equipment was reliable and capable of precisely obtaining the necessary information.

The careful planning and implementation of the validity of this thesis is based on the research methodology. This study offers trustworthy insights into the acceptability of robotization in hotels by following recognized standards for data collection and analysis and by guaranteeing the relevance and clarity of the survey questionnaire.

Information retrieval and source material

The thorough information retrieval and cautious source material selection, with a focus on critical assessment of sources and proper citation procedures, were necessary to ensure the reliability of this thesis. A methodical technique was implemented to ascertain reliable academic and industry sources to establish a strong theoretical framework. This involved carefully examining each source's reliability, applicability, and availability to support the study's validity. Furthermore, complete compliance with citation guidelines was followed throughout the thesis to guarantee openness and accountability of the study findings, in line with accepted standards for assessing the reliability of source materials and information retrieval.

7.2 Ethicality

Throughout the development of this thesis on robotization in hotels, an initial commitment to ethical research practices has been maintained, guided by the principles of Good Scientific Practice and the ethical guidelines established by JAMK University of Applied Sciences. Eckstein (2003) explains that good scientific practice involves sticking to moral and ethical standards at every stage of the research process including its design, execution, and dissemination is known as good research practice. It involves a commitment to reliability, integrity in the reporting of study results, fairness in author recognition, and consideration for each participant. The use of research results responsibly and the validity of scientific initiatives are guaranteed by good scientific practices. This

faithfulness to ethical standards has been a guiding light in ensuring the integrity and responsibility of the research process, from the literature review to the empirical study.

Informed Consent

All information on the thesis purpose, nature, and requirements for participation was provided to participants. All participants gave their informed permission, guaranteeing that they understood they may leave the research at any moment without facing any negative outcomes.

Anonymity and Confidentiality

The respondents' confidentiality and anonymity were ensured in the study's design. The poll did not gather any personal information, and all answers were handled with the highest confidentially. This approach ensured that participant privacy was maintained, and that no person could be identified from the data.

Voluntary Participation

Participation in the survey was entirely voluntary, highlighting the autonomy of the respondents in choosing to contribute to the study. This respects the principle of autonomy, a cornerstone of ethical research.

7.3 Discussion of the Main Results

Robotization in Hotels

As mentioned in Chapter 2, It was mentioned that including robotic services into hotels will have operational benefits, such as increased service efficiency and less human error. These assumptions

are supported by the study's results, which provide a high average score for the significance of robotization in the check-in procedure. Feedback from respondents, however, indicates that although these operational advantages are acknowledged, there appears to be a disconnect between theory and actual use, as seen by the inconsistent real-world experiences of visitors using robotic services. This makes it necessary to use robotic technology carefully and in a way that improves operational efficiency without sacrificing service quality.

Customer Experience

As outlined in Chapter 3, enhancing customer experience through technological innovation, including robotization, is a critical goal for the hospitality industry. Our survey's results provide a complicated picture: while robotic services are believed to be helpful for some operational duties, their effects on the overall visitor experience are not always simple. This difficulty recalls the theoretical discussions on balancing technological efficiency with the hospitality sector's signature of personal touch. It implies that careful management is needed when integrating robotization into service delivery to make sure it enhances rather than degrades the visitor experience.

Technology Acceptance

Drawing from the Technology Acceptance Model (TAM) explored in Chapter 4, the moderate perception of the ease of use of robotic services, as indicated by the median response, and the carefully open attitude towards fully robotized hotels reflect a critical intersection between technology acceptance and the hospitality industry's unique service context. These results offer concrete evidence for the TAM framework's claim that perceived ease of use and usefulness play crucial roles in determining technology adoption. The survey data, revealing reservations about fully embracing robotization, highlights the importance of addressing both the functional aspects of technology and the psychological comfort of guests interacting with it.

The neutral stance towards robotization and the varied levels of enthusiasm and reservations among guests highlight a critical area for further exploration. It suggests that while there is an

openness to integrating technology into hotel services, there remains a need for strategic approaches that align technological advancements with guest expectations and preferences. This involves not just improving the usability and functionality of robotic services but also engaging in thorough communication strategies to educate and reassure guests about the value and safety of these innovations.

7.4 Conclusions

In this study, the effects of robotization in the hotel sector were investigated and information was gathered from 89 respondents, most of whom were in the 18–24 age group. The younger generation's inclination towards technology may have an impact on their willingness to accept robotic services in hotels. The respondents' varying frequency of hotel visits indicates varying degrees of comfort and familiarity with hotel technologies, such as robots, mostly among Finnish visitors. This provides a cultural perspective on the acceptability of the technology in the hotel industry.

With universal smartphone usage and significant laptop/desktop computer use among respondents, the study found a high technology acceptance rate. This suggests that people are generally at ease using digital services, which may transfer into a favorable opinion of robotic services in hotels. The average awareness score regarding hotel robotization, however, only shows an average acquaintance with the idea, indicating room for improvement.

The study exposes an important preference towards human connection in hotel services as opposed to robots, highlighting the distinguishing feature of the hospitality sector—personal touch. Most respondents believed that robotization would increase service efficiency, and they recognized its operational benefits. However, the somewhat lower rating for improving customer experience relative to service effectiveness points to a more complex picture of how robotization affects visitors' experiences in general.

Particularly, the high average score for the check-in process's utility of robotization suggests that visitors find a great deal of value in automating this preliminary engagement. Respondents were in favor of robots obtaining information about food alternatives, lodging facilities, and nearby attractions. Information gathered through robotic services was also well-received. The more modest view of robotization for room service, on the other hand, suggests some reservations regarding

the benefits of deploying robots for this more intimate and customarily human-interaction-driven service.

Study's conclusions indicate that, despite a trend toward acceptance of robotic services in hotels, especially among younger populations, the sector must proceed cautiously. Maintaining the personalized touch that defines the hospitality experience while utilizing technology to increase operational efficiency is a delicate process. To promote a favorable visitor experience, the industry must integrate robotic services while keeping a close eye on client preferences and placing a strong emphasis on simplicity of use, customization, and synergy between human and robotic services.

7.5 Development Proposals for hotels

The development ideas that are presented in this section originate directly from the thesis and are customized for the hotel sector. With a focus on key areas identified by the research, including comfort levels with robot use, reservations towards full robotization, management of future expectations, promoting positive perceptions, and ensuring inclusive technology design, these recommendations aim to improve guest interactions with robotic services. Every proposal is developed based on in-depth research and insights learned during the study, with the aim of enhancing robotics integration in hotels to enhance the visitor experience.

Enhance Comfort with Robotic Interactions: There is potential for development in terms of helping visitors feel more at ease while using robotic services, as seen by the 3.0 median comfort level score. In addition to making sure that visitors are aware of how to utilize these services, hotels must concentrate on creating designs that are easy to use.

Address Reservation Towards Full Robotization: To maintain a balance between automated and personalized service, hotels should adopt robotization gradually and make sure that human personnel are present, as indicated by the neutral median score for completely robotized hotels.

Manage Expectations for Future Robotization: Given the common belief that robotization will increase, hotels should control visitor expectations by outlining the function of robotic services and how they improve the visitor experience.

Cultivate Positive Perceptions: While most guests are welcoming of new technology, a significant number are hesitant or uneasy. To calm apprehensions, hotels must conduct open and honest discussions on the advantages of robotic services and offer trials or demos.

Inclusive Technology Design: Hotels should make sure that robotic services are inclusively intended to accommodate all customers, regardless of their level of technological skill, considering the differing views of ease of use.

References

Aarni Tuomi, Elina Moreira Kares & Husna Zainal Abidin (2023) Digital cultural tourism: older adults' acceptance and use of digital cultural tourism services, Scandinavian Journal of Hospitality and Tourism, 23:2-3, 226-247, https://www.tandfonline.com/doi/full/10.1080/15022250.2023.2256698?scroll=top&needAccess=true

Charness, N., & Boot, W. R. (2016). Technology, gaming, and social networking. In Elsevier eBooks (pp. 389–407). https://doi.org/10.1016/b978-0-12-411469-2.00020-0

De Camargo Fiorini, P., Seles, B. M. R. P., Jabbour, C. J. C., Mariano, E. B., & De Sousa Jabbour, A. B. L. (2018). Management theory and big data literature: From a review to a research agenda. International Journal of Information Management, 43, 112–129. https://doi.org/10.1016/j.ijinfomgt.2018.07.005

Eckstein, S. (2003). Good research practice. In Cambridge University Press eBooks (pp. 205–213). https://doi.org/10.1017/cbo9780511550089.034

Eulerich, M., Waddoups, N., Wagener, M., & Wood, D. A. (2023). The Dark Side of Robotic Process Automation (RPA): Understanding Risks and Challenges with RPA. Accounting horizons, 1-10. https://doi.org/10.2308/HORIZONS-2022-019

Fernando, J. (2023, May 24). Compound Annual Growth Rate (CAGR) formula and calculation. Investopedia. https://www.investopedia.com/terms/c/cagr.asp

Funding & tenders. (n.d.). https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2023-digital-emerging-01-02

Galvis, N. (2021, December 23). What's the Difference Between Industrial Robots and Service Robots. RobotLAB Group. https://www.robotlab.com/group/blog/whats-the-difference-between-industrial-robots-and-service-robots

Henn na Hotel Tokyo Ginza, Booking.com (n.d) https://www.booking.com/hotel/jp/green-world-tokyo-ginza.fi.html?aid=2311236&label=fi-fi-booking-desktop-alGA1UyCaF6rACeV2Vk9KQS652828998145%3Apl%3Ata%3Ap1%3Ap2%3Aac%3Aap%3Aneg%3Afi%3Atikwd-65526620%3Alp1005684%3Ali%3Adec%3Adm&sid=6c982c7842046949524c60292dfc55bf&all_sr_blocks=254654528_378392503_1_1_0%2C254654528_378392503_1_1_0;checkin=2024-08-16;checkout=2024-08-18;dest_id=2546545;dest_type=hotel;dist=0;group_adults=2;group_children=0;hapos=1;highlighted_blocks=254654528_378392503_1_1_0%2C254654528_378392503_1_1_0;hpos=1;matching_block_id=254654528_378392503_1_1_0;no_rooms=1;req_adults=2;req_children=0;room1=A%2CA;sb_price_type=total;sr_order=popularity;sr_pri_blocks=254654528_378392503_1_1_0__3078000%2C254654528_378392503_1_1_0__3078000;srepoch=1712226253;srpvid=723949236a9e015d;type=total;ucfs=1&#hotelTmpl

Henn-Na Hotel - Japanese Robot Hotel. (n.d.). https://www.uniqhotels.com/henn-na-hotel Ho, K., Yu, C. C., & Lai, M. C. (2016). User Adoption of Government-to-Employee Portal of Hong Kong Government. In Encyclopedia of E-Commerce Development, Implementation, and Management (p. 124). https://doi.org/10.4018/978-1-4666-9787-4.ch124

Here's How Hilton Worldwide is Using the Internet of Things to Create a Truly Connected Travel Experience. (2019, October 17). Digital Travel US 2024. https://digitaltravel.wbresearch.com/blog/hilton-worldwide-connected-travel-experience-strategy-using-iot

Hotel features | Henn na Hotel Tokyo Ginza. (2019, May 20). Henn Na Hotel Tokyo Ginza. https://www.hennnahotel.com/ginza/en/concept/

Hotel Technology News. (2018, March 20). AccorHotels shares its vision for the smart room of the future. https://hoteltechnologynews.com/2018/01/accorhotels-shares-vision-smart-room-future/

Hotel Technology News. (2023). How Hotels are Using Robots to Reduce Costs, Improve Operations and Enhance the Guest Experience. Hotel Technology News. https://hoteltechnologynews.com/2022/09/how-hotels-are-using-robots-to-reduce-costs-improve-operations-and-enhance-the-guest-experience/

IFR International Federation of Robotics. (n.d.). International Federation of Robotics. https://ifr.org/service-robots

Jay Kandampully & Dwi Suhartanto (2003) The Role of Customer Satisfaction and Image in Gaining Customer Loyalty in the Hotel Industry, Journal of Hospitality & Leisure Marketing, 10:1-2, 3-25, https://doi.org/10.1300/j150v10n01_02

Lee, I. (2021). Service Robots: A Systematic Literature Review. Electronics, 10(21), 2658. https://doi.org/10.3390/electronics10212658

Mcleod, S., PhD. (2023). Likert Scale Questionnaire: Examples & Analysis. Simply Psychology. https://www.simplypsychology.org/likert-scale.html

Merriam-Webster. (n.d.). Robotics. In Merriam-Webster.com dictionary. Retrieved October 25, 2023, from https://www.merriam-webster.com/dictionary/robotics

Oitzman, M. (2021, August 18). Omron AMRs at the heart of hotel room service delivery. Mobile Robot Guide. https://mobilerobotguide.com/2021/08/17/omron-amrs-at-the-heart-of-hotel-room-service-delivery/

Operto. (2023, September 7). 9 Hotel Guest Expectations Every Hotelier Needs To Know. Operto Guest Technologies. https://operto.com/hotel-guest-expectations/

Rahman, R. (2023). Importance Of Guest Satisfaction In Hotel Industry. www.bdtask.com. https://www.bdtask.com/blog/importance-of-guest-satisfaction-in-hotel-industry

robotization. (2023). https://dictionary.cambridge.org/dictionary/english/robotization

Rosete, A., Soares, B., Salvadorinho, J., Reis, J., & Silva, C. (2020). Service Robots in the Hospitality Industry: An Exploratory Literature review. In Lecture notes in business information processing (Print) (pp. 174–186). https://doi.org/10.1007/978-3-030-38724-2_13

Service Robotics market size to hit US$ 169.50 BN by 2032. (n.d.). https://www.precedencere-search.com/service-robotics-market

Shin, H. (2022), "A critical review of robot research and future research opportunities: adopting a service ecosystem perspective", International Journal of Contemporary Hospitality Management, Vol. 34 No. 6, pp. 2337-2358. https://doi.org/10.1108/IJCHM-09-2021-1171

Shin, H.H. and Jeong, M. (2020), "Guests' perceptions of robot concierge and their adoption intentions", International Journal of Contemporary Hospitality Management, Vol. 32 No. 8, pp. 2613-2633. https://doi.org/10.1108/IJCHM-09-2019-0798

Spezialetti, M., Placidi, G., & Rossi, S. (2020). Emotion Recognition for Human-Robot Interaction: Recent advances and future perspectives. Frontiers in Robotics and AI, 7. https://doi.org/10.3389/frobt.2020.532279

Subject and Course Guides: Quantitative and Qualitative Research: What is Quantitative Research? (n.d.). https://libguides.uta.edu/quantitative_and_qualitative_research/quant

The Editors of Encyclopaedia Britannica. (2023, October 24). Robotics | Definition, Applications, & Facts. Encyclopedia Britannica. https://www.britannica.com/technology/robotics

The rise of service robots in the hospitality industry: Some actionable insights | Boston Hospitality Review. (2021, October 4). © 2024 Boston University. https://www.bu.edu/bhr/2021/10/04/the-rise-of-service-robots-in-the-hospitality-industry-some-actionable-insights/

Tuomi, A., Tussyadiah, I. P., & Stienmetz, J. (2021). Applications and Implications of Service Robots in Hospitality. Cornell Hospitality Quarterly, 62(2), 232-247. https://doi.org/10.1177/1938965520923961

Wadhwa, R. (2023, March 15). How a smart hotel room can elevate the guest experience. Press reader. https://blog.pressreader.com/hotels/how-a-smart-hotel-room-can-elevate-the-guest-experience

Warschauer, M. (2003). Technology and social inclusion. In The MIT Press eBooks. https://doi.org/10.7551/mitpress/6699.001.0001

What are service robots? - Intel. (n.d.). Intel. https://www.intel.com/content/www/us/en/robotics/service-robot.html

What is CX? (2022, August 17). McKinsey & Company. https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-cx

Worsfold, K., Fisher, R., McPhail, R., Francis, M. and Thomas, A. (2016), "Satisfaction, value and intention to return in hotels", International Journal of Contemporary Hospitality Management, Vol. 28 No. 11, pp. 2570-2588. https://doi.org/10.1108/IJCHM-04-2015-0195

Worthington, A. K. (2021, May 30). Technology Acceptance model. Pressbooks. https://ua.pressbooks.pub/persuasiontheoryinaction/chapter/technology-acceptance-model/

Xu, S., Stienmetz, J. and Ashton, M. (2020), "How will service robots redefine leadership in hotel management? A Delphi approach", International Journal of Contemporary Hospitality Management, Vol. 32 No. 6, pp. 2217-2237. https://doi.org/10.1108/IJCHM-05-2019-0505

Yang, J., Chew, E. A Systematic Review for Service Humanoid Robotics Model in Hospitality. Int J of Soc Robotics 13, 1397–1410 (2021). https://doi.org/10.1007/s12369-020-00724-y

Yasar, K., & Hanna, K. T. (2023, July 12). robotics. WhatIs. https://www.tech-target.com/whatis/definition/robotics

Appendices

Intro to the survey:

Welcome to this survey, a key component of my thesis research at Jyväskylä University of Applied Sciences. The focus of my thesis is to explore and understand the attitudes of hotel guests towards the use of robots in hotel services. Robotization in this instance includes both physical service robots and software robotics, such as technology-assisted self-service systems Your participation is invaluable in helping to shed light on this emerging aspect of the hospitality industry.

This survey is completely anonymous and voluntary. Rest assured, all responses will be treated with the utmost confidentiality and will be used exclusively for academic purposes within the framework of this thesis. There will be no way to link your responses back to you at any stage.

Your insights will greatly contribute to a deeper understanding of guest perceptions and preferences regarding the integration of robotics in hotel services. Thank you in advance for your time and valuable input. For any inquiries or additional information, please feel free to reach out to me at N1374@student.jamk.fi.

This questionnaire should take 5-10min of your time.

The questionnaire will close on the 14.2.2024.

Let's begin!

-Nikita Skachkov

Survey questions

Q1

1. Age *

- ○ 17 or younger
- ○ 18-24
- ○ 25-30
- ○ 31-40
- ○ 41-50
- ○ 51-60
- ○ 61 or older

Q2

2. Gender *

- ○ Male
- ○ Female
- ○ Dont't want to tell

Q3

3. Nationality *

Select

Q4

4. How often do you stay in hotels? *

- ○ Every month
- ○ Few times a year
- ○ Once a year
- ○ Less than once a year

Q5

5. Which of the following technological devices do you use regularly in your daily life? *

- ☐ Mobile Phone / Smartphone
- ☐ Laptop / Desktop Computer
- ☐ Tablet
- ☐ Smart Home Devices (smart speakers, smart thermostats)
- ☐ Wearable Tech (smartwatches, fitness trackers)

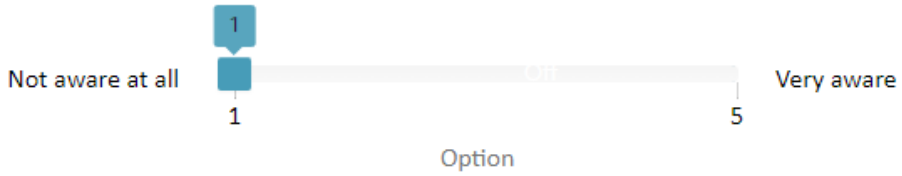
Q6

6. For each selected device, indicate how often you use it *

	Multiple times a day	Once a day	A few times a week	Once a week	Less than once a week
Mobile Phone / Smartphone	○	○	○	○	○
Laptop / Desktop Computer	○	○	○	○	○
Tablet	○	○	○	○	○
Smart Home Devices (smart speakers, smart thermostats)	○	○	○	○	○
Wearable Tech (smartwatches, fitness trackers)	○	○	○	○	○

Q7

7. On a scale of 1 (Not aware at all) to 5 (Very aware), how aware are you of the use of robots in the hotel industry?
*



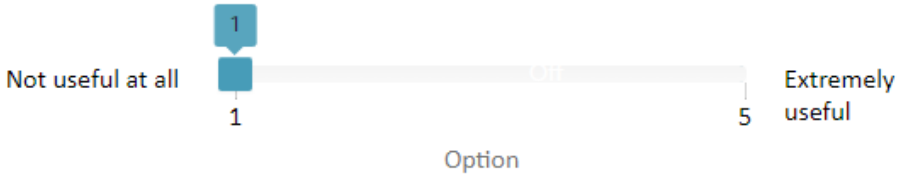
Q8

8. Would you prefer human interaction instead of robots in hotel services? *

- ○ Always
- ○ Often
- ○ Rarely
- ○ Never

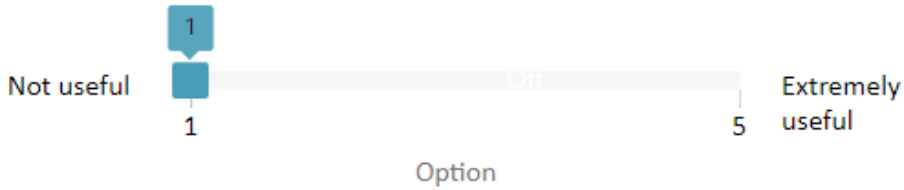
Q9

9. How would you rate the usefulness of robotization in hotels for improving service efficiency? *



Q10

10. How would you rate the usefulness of robotization in improving guest experience? *



Q11

11. If you had the choice of being served in a hotel by a member of staff or a robot, which one would you choose and why?

Q12

12. Have you stayed in a hotel where you have been served using robotics? *

Select

Yes

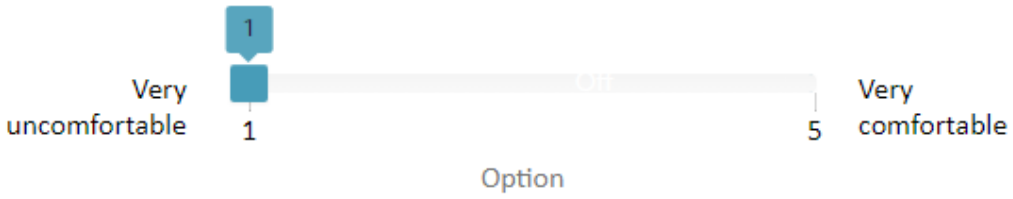
No

Q13

13. On a scale of 1 (Very difficult) to 5 (Very easy), how easy do you think it would be to interact with robots in hotels?
*

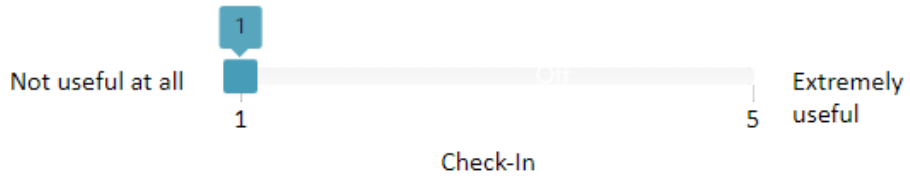
Q14

14. How comfortable would you feel interacting with robots for hotel services? (1 = Very uncomfortable, 5 = Very comfortable)
*



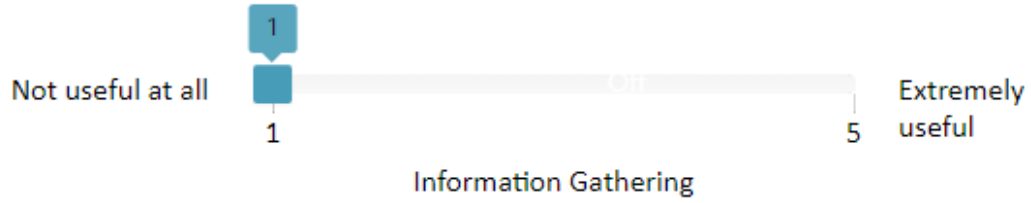
Q15

15. On a scale of 1 (Not useful at all) to 5 (Extremely useful), how useful do you find robotization in hotels for specific tasks? *



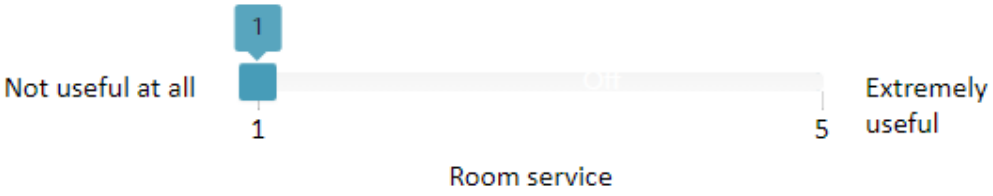
Q16

16. Enter question text *



Q17

17. Enter question text *



Q18

18. In your opinion, what is the biggest disadvantage of robotization in hotels? *

- [ ] Lack of personal touch
- [ ] Technical issues
- [ ] Privacy concerns
- [ ] Job displacement
- [ ] Other, what?

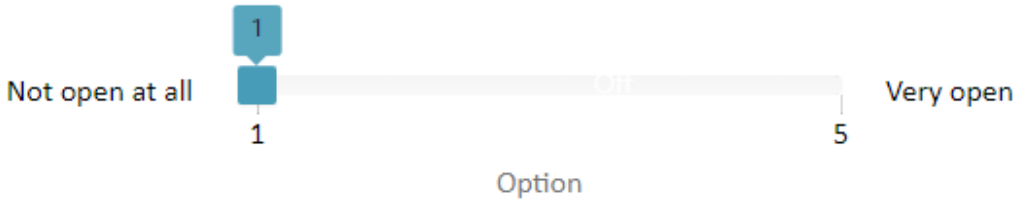
Q19

19. What about the biggest advantages of robotization in hotels in your opinion? *

- [ ] Improved efficiency
- [ ] Cost savings
- [ ] 24/7 service availability
- [ ] Enhanced guest experience
- [ ] Other, what?

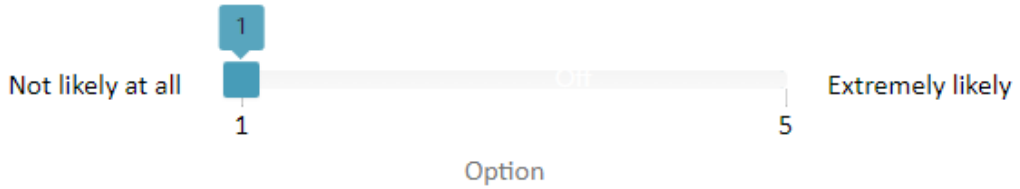
Q20

20. How open are you to staying in a fully robotized hotel? *



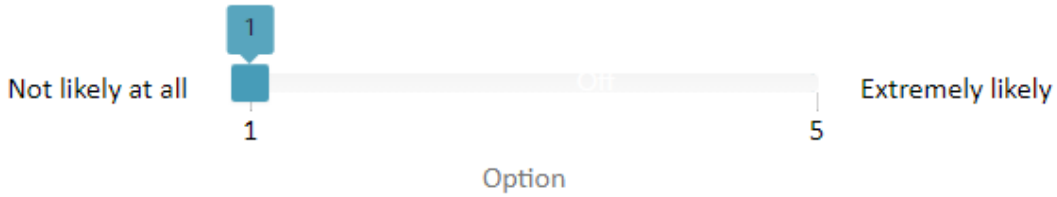
Q21

21. Do you think robotization in hotels will become more common in the next 10 years? *



Q22

22. How likely are you to choose robotized services in the future? *



Q23

23. In your opinion, usage of new innovative technologies in hotels are important for you as a customer?
*

- ○ Definitely yes
- ○ Probably yes
- ○ Unsure
- ○ Probably no
- ○ Definitely no

Q24

24. Additional comments or thoughts about robotization in hotels