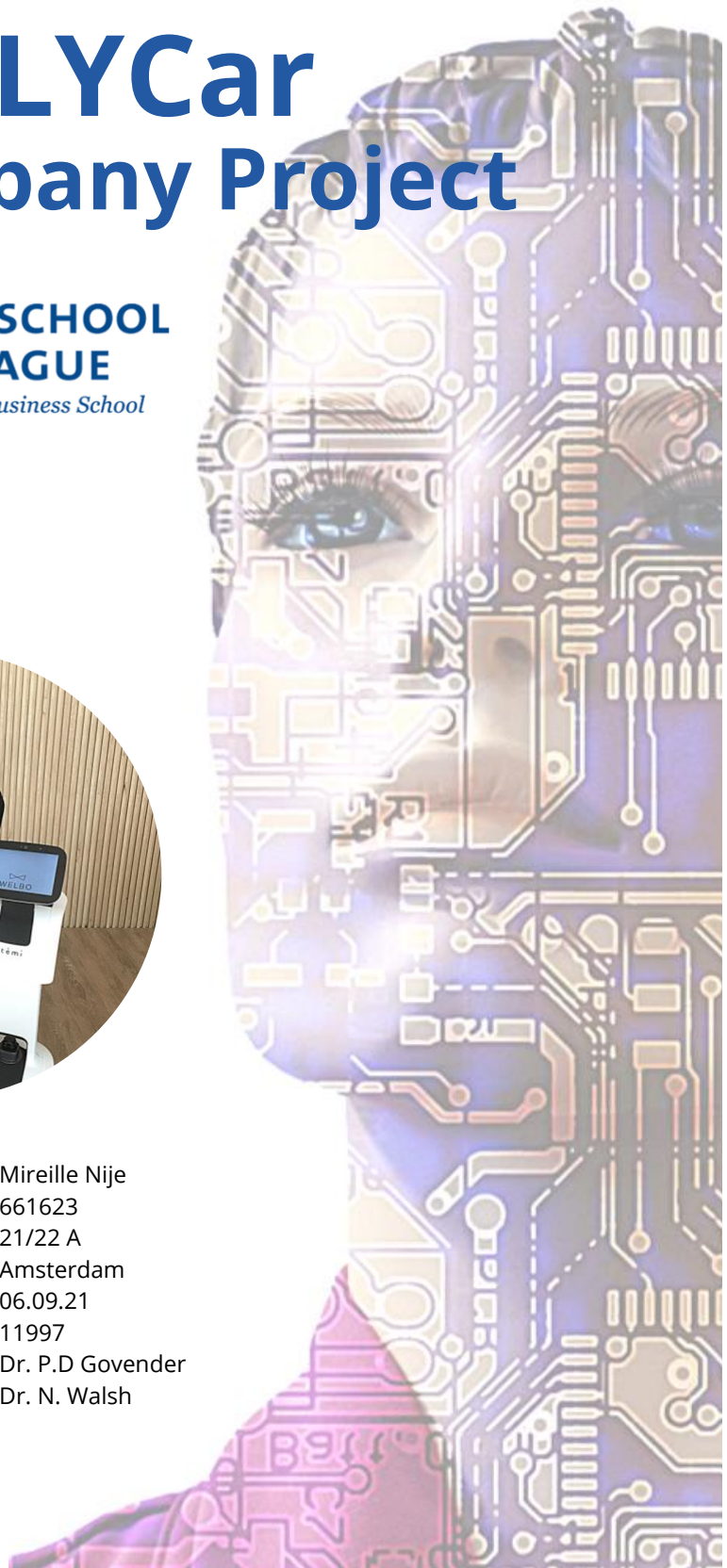


LYCar Company Project



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Preface

Dearest reader,

The final course at Hotelschool The Hague is called Launching Your Career (LYCar). It is asked from the student to deliver a Career Launching Plan (CLP), LYCar Proposal and eventually pursue towards LYCar execution which consist of a Company Project, Career Portfolio and ultimately a LYCar Defence. The past couple of months my focus has been on finalizing my internship, the Career Portfolio (CP) as well as the Company Project Report (CPR). The Career Portfolio focusses on my reflection and evaluation on my personal growth. In addition, professional products have been made for the internship company which showcase my professional learning with underpinning of my chosen PLO's.

A thoroughly written Company Project Report lies before you, which provides an execution on the five steps of the Design-Based Research i.e Problem Definition, Analysis & Diagnosis, Solution Design, Intervention, Evaluation and Learning. This report is written for Ms. de Korte, a lecturer at Hotelschool The Hague (HTH). The commissioner desired to obtain useful insights on the implementation of AI in the hospitality. Therefore, the goal of this research is to gain foundational knowledge into the adoption of service robots in service-related industries, particularly in hotels. In addition, an understanding on how Human-Robot interactions (HRI) affects the guests' perception on different frontline service encounters will be provided. A considerable amount of time, dedication and energy has been put in this report. It is with great pleasure to present this report to the reader.

With warm regards,

Mireille Nije



Acknowledgements

Throughout the execution of the Company Project Report, I have received a great deal of support. This acknowledgement section offers a chance to express gratitude to those who have helped during the writing process. Therefore, I would like to thank the following people:

Dr. Govender, who has challenged me to think critically and herewith enhanced my knowledge on the research done. Every online Microsoft Teams session gave me new insights and other points of view to consider. Moreover, he has given advice and guidance when needed.

Ms. de Korte, for allowing the opportunity to conduct research on such an essential, integral, and interesting topic.

My peer group, who have been supportive throughout the entire writing process. We became a truly close group that provided one another with the advice and support needed. Nevertheless, we challenged each other to deliver the best work we could.

My friends, in particular Aaron Auping and Jip Hanemaaijer who have provided me with feedback and a 'fresh pair of eyes' whenever I needed it. They have been my emotional support and pushed me to believe in myself. I cannot express enough gratitude for their involvement throughout this process.

Abbreviations

Abbreviation	Meaning
LYCar	Launching Your Career
CLP	Career Launching Plan
CP	Career Portfolio
CPR	Company Project Report
PLO	Program Learning Outcome
HTH	Hotelschool The Hague
DBR	Design-Based Research
AI	Artificial Intelligence
HRI	Human-Robot Interaction
SRQ	Sub Research Question
MRQ	Main Research Question

Glossary

Human-Robot Interaction: "The field of human-robot interaction addresses the design, understanding and evaluation of robotic systems, which involve humans and robots interacting through communication" (Murphy et al., 2010).

Service robot: "System-based autonomous and adaptable interfaces that interact, communicate and deliver service to an organization's customers" (Writz et al., 2018).

Guests' perception: "the way that humans think about or the impression they have of objects or agents" (Bartneck et al., 2009).

Godspeed Dimensions: "The most important predictors for human preferences between different robot behaviors, captures five dimensions: Anthropomorphism, Animacy, Likeability, Perceived Intelligence and Perceived Safety" (Bartneck et al., 2009).

Executive Summary

The LYCar Company Project Report is the final deliverable of the course, Launching Your Career. The report consists of seven chapters to structurally guide the reader through the researchers' journey.

Chapter 1: Problem Definition

The present research analyzes the current problem of the rapid development of artificial intelligence that is expected to influence service-oriented businesses. This report puts emphasis on the development of service robots, a representative of artificial intelligence. The industry scope is the hotel industry, who are actively employing these non-human service agents. The application of service robots in hotels is still in its initial development stage and greatly influences the nature of personalized services as some frontline service encounters will be redefined by human-robot interactions. Unlike other industries, the hotel industry symbolizes hospitality, replacing employees with robots not only changes the hospitality aspect, but may lead to a shift in hotel guests' staying experience. A successful outcome of service robots is highly dependent on its users.

How do guests perceive human-robot interaction provided by service robots during frontline service encounters in the hotel industry?

Chapter 2: Analysis and Diagnosis

The literature on the application of service robots is still limited. The majority of studies have focused on the technical side of robotics, aiming on performance of automated services. Given the brief history of robotics entering the hotel industry, the impact of service robots on guests' perception has yet to be discovered.

Service robots have already been implemented in diverse facets in hotel operations. In the hotel industry, services are more exposed to direct human interaction. Literature argues that the success of these robots relies upon positive perceptions of its user. Therefore, for effective human-robot interaction, the characteristics of robots should be acknowledged to induce positive perception. These characteristics include, anthropomorphism, animacy, likeability, perceived intelligence, and perceived safety.

As the research at hand is exploratory, qualitative research methods are used. The flexibility of qualitative research allows to evaluate the characteristics aforementioned. Both primary and secondary data was collected to ensure the reliability and validity of the findings. The primary data consists of 190 guest reviews and the second data was collected by conducting expert interviews.

The results confirmed that a favorable outcome of the adoption of service robots relies upon positive perceptions of its user. As the guests' perception on service robots was missing from the literature, the results gathered outline the positive and negative guests' perceptions. The negative perceptions should be tackled for guests to have a positive perception towards their communication with service robots.

Chapter 3: Solution Design

The solution presented will serve as a theoretical contribution to the stakeholders involved. A whitepaper was made for WELBO, a company that supplies service robots, which has been proven to be beneficial as the presented research is highly requested by hoteliers. In addition, the current research can serve as a benchmark for further research. Academic researchers that are currently looking into the applications of service robots in the hotel industry can benefit from the research done.

Chapter 4: Plan of implementation

While introducing the stakeholders involved with the researcher's insights and learning outcomes on this novel topic, the whitepaper will provide as a suggestion what could be done to enhance customers perception. The whitepaper suggests that human staff and service robots do better together in hotel frontline services. The hotel industry, its employees and its customer will have to undergo a significant shift to accept service robots.

Chapter 5: Plan of evaluation

The current research and the whitepaper presented can be evaluated as a forward-looking research design. However, each characteristic considered can be evaluated through the guests' perception. A questionnaire that evaluates the Godspeed dimensions can be used to evaluate guest perception.

Chapter 6: Dissemination

To share the knowledge gathered, the outcome has been shared, presentations were given, and a blog post has been initiated.

Chapter 7: Academic reflection

the main challenge of this research was to implement my findings due to the novelty of service robots in hotels. The current research will have to be further explored. A recommendation for future research is to perform a comparison with leisure or business guests or perceptions of hoteliers or frontline staff can be examined, especially when tasks and working procedures have to be adjusted.

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Introduction

Who is Mireille?

Please allow me to properly introduce myself. My name is Mireille Nije and I am 26 years old. I am Dutch, but I have been raised on a Caribbean Island called Curaçao. If I were to describe myself, then one thing truly stands out; I am a people person. I am social, emphatic and engaged. Being people-oriented is my second nature, my first would be my passion for hospitality. My affection for hospitality started way before entering the Hotelschool doors. The international hospitality world was introduced to me since childhood. My parental home was surrounded by apartments that my parents rented out. As a result, I was involved with guest experience on a daily basis and my interest in hospitality increased every day. This interest resulted me to apply for Hotelschool the Hague. During my time at HTH I gained practical experience as well as theoretical knowledge. After having several part-time jobs within hospitality, my practical experience enhanced during my first internship. My internship in Mallorca allowed me to develop the habit of keeping a critical eye on several aspects of the operation, whether that was the quality of service or customer satisfaction. I also gained knowledge and understanding of other cultures. When learning about other people and understanding their cultures, it allowed me to create more meaningful relationships with guests and colleagues. During the second and third phase of Hotelschool, I learned how to build relationships by recognizing diverse cultures and foster better teamwork. Working in diverse teams has led me to ensure collective collaborations. Additionally, I learned more diverse aspects of the hospitality business environment through the diverse courses and chosen electives. All the aforementioned aspects have prepared me for the final phase of my study. It was time to plan my future by combining all that I have learned into a career path I want to follow: The LYCar journey. The past five years and this final LYCar phase has shaped me into the open-minded, ambitious young professional that I am now. I could not be more grateful for the valuable learning experiences and for all the influential relationships that have helped me develop during my time at Hotelschool the Hague.

My LYCar Journey

My LYCar Journey will be explained by means of the visual shown below. The visual outlines the different deliverables and phases of LYCar.

Launching Your Career

Career Launching Plan

NOVEMBER 2020



The CLP is the first official deliverable of LYCar. The CLP provides an overview of my personal and professional development, including my strengths and areas of development. Also, my future expectations are discussed with its traits and goals. The PLO's chosen (1 and 2) will serve as guidelines for my professional products made during my internship, both are in line with marketing, sales & distribution

LYCar Proposal

MARCH 2021



The Proposal part of LYCar was commissioned by Ms. de Korte via the research centre of HTH. The goal of the research is to gain foundational knowledge into the adoption of service robots in service settings, particularly in hotels. Along with gaining knowledge on the true content on how customers really perceive Human-Robot Interaction (HRI) during service encounters.

Internship at The Hospitalist

FEBRUARI - AUGUST 2021



February 15th, 2021 I started a marketing & communications internship at The Hospitalist. I got the opportunity create a strategy within a marketing sub-department. I set out to contribute to and execute marketing and communication plans based on consumers behavior.

LYCar Career Portfolio

SEPTEMBER 2021



Within the Career Portfolio the professional learnings are underpinned within the chosen PLO. This led to providing professional product for the marketing department of The Hospitalist. A self-reflection is given in terms of AQ and EQ. Additionally, an evaluation is given which shows development as an Intercultural Hospitality Leader.

LYCar Company Project Report

SEPTEMBER 2021



The CPR is the final deliverable for LYCar. The report outlines the 5 steps of the DBR cycle, the goal of the CPR is to investigate the perceptions of customers on HRI during service encounters. When understanding the guests' perception, this study can contribute to the hotel industry by examining the current findings, to suggest what could be done to enhance customers perceptions on HRI with service robots in the future.



READY FOR LYCAR EVENT

Please refer to Appendix 1 for the executive summary of the LYCar proposal.
Please refer to Appendix 2 for the assessment form of the LYCar proposal.

Structure of the Company Project Report

The Design-based research (DBR) serves as a guideline towards the research approach for the LYCar Company Project Report. The knowledge development of DBR can be divided into two categories; tangible, practical outcomes and intangible, theoretical outcomes (Armstrong et al., 2021). DBR aims to generate meaningful, effective educational products that can be transferred and adapted (Barab and Squire, 2004). It is important to acknowledge that DBR is not only concerned with improving practice but also underpins the value of theory and understanding (Collins et al., 2004). DBR's emphasis on the importance of context improves the knowledge claims of the research. The DBR is used as the research approach for the LYCar CPR:



Figure 1: Research structure CPR.

Chapter 1: Problem Definition

Preliminary Research

Traditionally, service providers have been humans. However, due to the rapid development of Artificial Intelligence (AI), numerous aspects of service-oriented businesses such as the hospitality industry are expected to be influenced (Tung & Au, 2018). We tend to keep seeking for innovating concepts, which add value and make simple and repetitive activities more efficient (Schulze, 2019). In the immediate future, we are facing the fourth industrial revolution, which is characterized by a fusion of technologies like AI and robotics (ibid). This research report puts emphasis on the development of service robots, a typical representative of AI. The hotel industry is actively employing these non-human service agents throughout its operations. They are expected to carry out various frontline services, including welcoming guests, check-in, hotel guidance and product delivery. Noticeably, the global market for service robots has predicted to generate a revenue of \$34 billion by 2026, with 1.3 million robot installations (Marr, 2019). In addition, a study by Oxford Economics, believes that 20 million jobs could be replaced by robots in the next 10 years (Oxford Economics, 2019). Innovative hotels are increasingly adopting service robots in their frontline services. Introducing new technology like service robots greatly influence guest experience (Tung and Au, 2018). However, the potential advantages of service robots cannot be reached unless guests value services delivered by robots.

The industry scope of this report is the hospitality industry, with its focus on hotels. In today's circumstances contactless guest engagement has become a matter of great importance for hoteliers. Due to the Covid-19 pandemic, it became essential to adapt low-contact features (Koumelis, 2020). Major hotel chains are opting several technologies to attract and comfort guests with contactless experiences. Due to the current Covid-19 pandemic and the tremendous progress in the development of AI, service robots are becoming a norm in hotels. Consequently, the application of service robots is evolving rapidly and perceived to be a future workforce in hotels. Robotic butlers have been implemented to deliver amenities to guestrooms (Crook, 2014). Moreover, a robot concierge has been applied that informs guests about hotel amenities and offers information about restaurants and travel tips in the destination (Hilton, 2016). The Henn-na hotel in Japan, the first hotel employed by robots, is using service robots throughout its entire operation. From check-in at the front desk to automated luggage delivery and in room companion (Guardian, 2015). These technological advancements indicate that the implementation of AI, and thus service robots, greatly influence the nature of frontline services. In fact, some frontline service encounters have been redefined by human-robot interaction (HRI) (Tussyadiah and Park, 2018).

Nevertheless, the application of service robots in hotels is still in its initial development stage. Hotel service robots were designed to reduce waiting times, improve efficiency, and reduce labour costs. However, service robots are also expected to build upon hotel guests' staying experience (Ivanov et al., 2017). This expectancy drew attention among several stakeholders within the hotel industry, including owners, employees, guests, industry associations, suppliers, and academic institutions (Tnooz, 2016). Considering that service robots will deliver consistent, convenient, and efficient services (Johnson et al., 2015). Many hotels have implemented service robots to provide an expectational guest experience (ibid). However, the expected benefits cannot be reached unless guests accept these technological changes.



Besides the aforementioned benefits and the benefits of contactless experiences, there has been little research on the perception of guests towards robots and the factors associated with HRI. The majority of studies have focused on the technical side of robotics, aiming on performance or intention to use automated services. However, given the brief history of robotics entering the hotel industry, the impact of service robots on guests' perception has yet to be discovered (Tung & Au, 2018).

In context of users' technology adoption, presumably, each hotel guest has a different perception and attitude towards service robots (Lee et al., 2020). Some, for example, might put more emphasis on human touch, while others might prefer their services to be more automated.

Guests perceive that service robots cannot execute or compensate certain aspects, such as human-to-human interaction (Tung and Au, 2018). There were complaints due to the failure to understand and respond to hotel guests' requests (Zhong et al., 2020). Hotels describe having profound human contact, replacing employees with robots, not only changes the nature of service, but may lead to a transition in attitudinal and behavioural outcome among guests (Pan et al., 2015). Therefore, how customers perceive service robots remains important to explore to guarantee a successful outcome of service robots in various frontline services in the hotel industry (Tussyadiah et al., 2020).

Research Relevance

The adoption of service robots greatly influences the nature of personalized services as some frontline service encounters will be redefined by HRI. The success of service robots depends on the satisfaction of its users (Bartneck et al., 2009). Guests can be very sceptical when envisioning a future involving interaction with service robots. As service robots are an essential and integral part in the hotel industry, the influence that HRI has on guests should be understood. Understanding the value of service robots from the guest's perspective is fundamental to gain insights into HRI (Lin and Mattila, 2021). Unlike other industries that adopted service robots, the hotel industry symbolized hospitality. Guests value human contact rather than human-like contact. Therefore, hotel industry practitioners and academic institutions have requested for in-depth research on guests' perceptions of service robots that highlights HRI. While some of this might seem far-fetched, AI will allow the replacement of humans with service robots capable enough of carrying out interactive tasks (Nóvoa et al., 2021).

When the pivotal elements of the guests' perceptions towards using service robots are identified, hotels can provide better service, decrease their budget, and enhance service experience. Exploring guests' perception during different service encounters would provide a clearer understanding on the future of service robots in the hotel industry. To the best of the researcher's knowledge, no attempt was made to analyse guests' perception on HRI during frontline service encounters. Therefore, this study attempts to capture hotel guests' perceptions of using service robots. As this is not yet considered a mature field of research, this analysis provides a clear set out study context and creates reasoning to conduct research.



Goal of Research

Goal of commissioner

To gain further insights into the adoption of service robots in service-related industries, particularly in hotels. Additionally, to obtain an understanding on how HRI affects the guests' perception on different frontline service encounters.

The commissioner desires to obtain useful insights on an in-depth study on the implementation of AI in the hospitality industry.

Goal of Researcher

To provide foundational knowledge to understand the future of service robots in hotels, and to investigate guests' perceptions on HRI during various service encounters.

When understanding the guests' perceptions, this study can contribute to the hotel industry and research institutions by examining the current findings, to suggest what would be done to enhance customers perceptions on HRI with service robots in the future.

Main Research Question

The preliminary research led to the key concepts of this study, namely Guests' Perceptions, Service Robots and Human-Robot Interaction. Those concepts facilitated the following main research question:

How do guests perceive human-robot interaction provided by service robots during frontline service encounters in the hotel industry?

Chapter 2: Analysis & Diagnosis

Literature Review

Service robots in hotels

With the considerable growth and development of robotic technology, service robots are more commonly playing an increasing role in our everyday life. Services given within hotels are no exception. Due to the implementation of service robots, services are expected to be profoundly changed in the future. This expectation drew attention among several stakeholders within the hotel industry, mostly, owners, employees, and guests (Tnooz, 2016).

Service robots are still in their developing stage in the hotel industry. However, the implementation of service robots in hotels is expected to accelerate (Lambert and Cone, 2019). Frontline service robots, as the name suggests, are meant to perform service-related tasks, which are people and service oriented through physical and social interactions (Ivanov et al., 2017). Service robots can be applicable in various hotel service settings, including the customer facing ones. In fact, the hotel industry has already implemented service robots in diverse facets of its operations, including greeting, check-in, housekeeping, food and beverage, guidance, providing information, baggage delivery, bookings, payments, documentation, and personal services (Park, 2020). Henn-na hotel in Japan was the first hotel to hire service robots all-round their operation. In the reception area, they employed a humanoid female and a zoomorphic dinosaur robot that serves guests as the guests push on certain buttons (Osawa, 2017). At the entrance, a robotic arm and a porter robot carries, stores and delivers luggage to guest rooms. In the hotel room, there is an in-room robot companion that operates on voice commands and reacts to the guest requests. It can control the television, change lights and answers questions about the time or weather (ibid). Starwood employed a butler service robot in their Aloft hotel that mainly provides conveniences to the guest accommodations (Crook, 2014). Yotel is another hotel that uses service robots that cater to the guest needs such as, delivering amenities to guest rooms, storing luggage and other simple and repetitive tasks (Hochman, 2018). Hilton was the first hotel that introduced a robotic service concierge that could inform guests about the facilities in the hotel, restaurants in the neighbourhood or local activities. Hilton uses Softbank's Pepper robots, who are able to carry out concierge and waiter duties in hotels and restaurants (Mende et al., 2019). Softbank robotics is a dominant robot manufacturer that have sold over 25,000 service robots like Pepper (ibid).

The success of these service robots relies upon positive perceptions of its user (Bartneck et al., 2019). Therefore, the characteristics of robots should be acknowledged to induce positive perceptions from consumers during the given service. With regard to the robots' design, service robots can have a physical presentation, like Pepper, or they can be virtual, like Alexa (Wirtz et al., 2018). This study focuses on the physical forms. Service robots can have a humanoid or nonhumanoid appearance, depending on their level of anthropomorphism, meaning their human-like characteristics. Pepper is an example of an anthropomorphic robot, which has capable movements and the ability to communicate with people. Because of Pepper's abilities, it has been used in different service areas (Cheung, 2017). Zoomorphic robots are based on animal-like characteristics such as the dinosaur robot receptionist at Henn-na hotel. Humanoids have gained significant attention due to the benefit of their appearance (Tussyadiah and Park, 2018). Generally, previous research indicated that a humanlike appearance has a higher possibility to generate positive perceptions towards guests (ibid).

Another characteristic that should be recognized is animacy. Service robots that are lifelike can have a positive perception on its user as they can demonstrate a certain degree of personality (Lee et al., 2006).

Service robots are defined as “system-based autonomous and adaptable interfaces that interact, communicate and deliver service to an organization’s customers” (Writz et al., 2018). However, multiple definitions have been found in literature. Service robots have been used to describe as “an autonomous or semi-autonomous robot that interacts and communicates with humans by following behavioural norms expected by people with whom the robot is intended to interact (Bartneck and Forlizzi, 2004). The International Organization for Standardization have defined service robots as “a robot that frees humans by performing useful tasks for them. Whereas Murphy et al., (2017) argues that services robots are “autonomous physical devices capable of operating and performing services without continuous human guidance”.

Notably, service robots are able to help humans by automating basic tasks of hotel services. While the introduction of service robots has reduced labour costs, enhanced employee tranquillity and operational efficiency, some aspects of hotel employees’ services and tasks are challenging to replace and automate (Lambert and Cone, 2019). However, by means of multiple sensors, service robots are now able to adapt to evolving situations; they are learning what service is (de Kervenoael, 2020). This had led people to believe that service robots could potentially deliver appropriate and consistent services (Johnson et al., 2015). Nevertheless, Tussyadiah et al., (2020) mentioned that consumers have an unfavourable attitude towards robotic services due to the negative perception of technology in general. Despite these mixed findings, the perceived value of service robots does not derive from the robot itself, but the service it provides (Lin and Mattila, 2021). In essence, hotels facilitate according to the guests needs and values. Note that, hotels have an opportunity to co-create the needs and values of customers with robotized service. However, what is missing from the service robot literature is a deeper understanding of the guest perception to service robots. Therefore, to guarantee a successful application of robotics in the hotel industry, it is important to keep an eye on how guests view, feel and respond to these robotics. The robots appearance and behaviour need to be acknowledged. By doing so, guests might find engaging with service robots less uncomfortable.

Human-robot interaction

In the hotel industry, services are more exposed to direct human interaction. Guests interact with staff during every service encounter, starting from the minute of arrival until departure. Therefore, it is crucial for hotel stakeholders including, owners, managers, employees, and guests to recognize and understand how guests communicate with service robots and visa versa. This because it implies the customers' long-term willingness to effectively use service robots (Shin and Jeong, 2020).

HRI is a study based to evaluate, understand, and design service robots and how they socially interact with humans (Goodrich and Schultz, 2007). Service robots are evolving fast, and as a result, the requirement of effective HRI is necessary. Effective HRI is the key to develop the robot's performance and it serves as a guideline for improving the customers' perceptions (Collins, 2020). Dautenhahn (2013) explains that:

"HRI is the science of studying people's behaviour and attitudes towards robots in relationship of the physical, technological and interactive features of the robot, with the goal to develop robots that facilitate the emergence of human-robot interactions that are at the same time efficient, but are also acceptable to people, and meet the social and emotional needs of their individual users as well as respecting human values".

The study of how robots socially interact with humans has developed rapidly since the 1990s (Admoni and Scassellati, 2017). The way that social robots and humans interact is to some extent dependent on the communication flows (ibid). Therefore, HRI is distinguished into two categories:

- **Direct interaction:** The human and the robot are in one place, which exposes the bidirectional flow of information (Thrun, 2004).
- **Indirect interaction:** The human and the robot are at a distance, which exposes unidirectional communication whereby a robot acts on the orders by an operator and responds back to the consumer (Thrun, 2004).

The hotel industry has shown interest in service robots where direct interaction is required because of their physical presentation. Yu and Ngan (2019) discovered that movability, such as hand and head movement, influences users' perception towards HRI. Robot mobility is a feature whereby humans distinguish robots from other technological developments (Tsarouchi et al., 2016). As for the physical presentation, previous studies have indicated that a humanlike appearance encourages a positive perception and attitude towards HRI. Service robots that look similar to humans affect customers emotionally, which then influences users' behaviour as a certain degree of trust in the robot is established (Waytz et al., 2014). However, robots that seem too humanlike may not be ideal for social interactions as customers might find it uncomfortable. The physical and behaviour designs need to be carefully considered, such as size and eyes. A robot that is too large may be overwhelming, though if it is too small guests might ignore it or not notice it at all. To draw attention into a conversation, eye contact and the way that robots look, and gazes need to be fitting (Collins, 2020). Recognizing users' emotion through facial expressions and physical gestures is crucial to gain affection during interaction. Anthropomorphic characteristics and lifelike capabilities are considerably valuable for efficient HRI, especially within the hotel industry (Murphy et al., 2019).

Thus, there are many factors that need to be considered for service robots to provide effective HRI. Those factors can be seen as guidelines for improving the customers' perception to ensure customers willingness to use service robots during service encounters (Collins, 2020). The service encounter is considered as "the critical moment of truth" in which guests evaluate the service (Lu et al., 2020). The interaction between humans and robots is mainly focused on the exchange of requests and responses of the service encounter (Zheng et al., 2013).

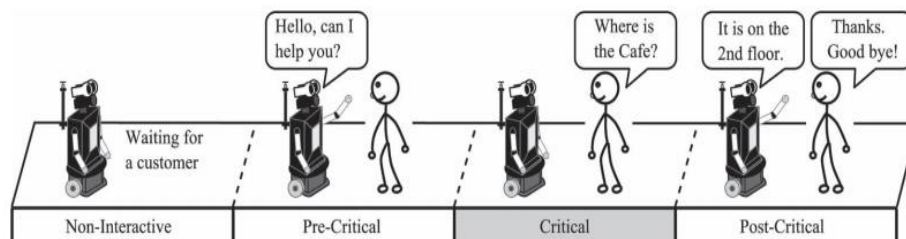


Figure 2: Guest-robot interaction phases (Zheng et al., 2013)

As illustrated in figure 2, interaction between guest and robot can be divided into several phases:

- **Non-interactive phase:** In this phase the robot is just simply waiting for the guest's arrival.
- **Pre-critical phase:** This is the phase when a guest arrives, and the interaction can be automated. This includes behaviours like greeting and making an introduction.
- **Critical phase:** During this phase an operator's attention is needed as there is a high risk of error by automation. This phase begins when the guest starts to interact. The operator is then needed to recognize the guests' request and make an appropriate response.
- **Post-critical phase:** In this phase the operator's control is finished, and the automated system can handle the interaction (Zheng et al., 2013).

The key concept of these phases is that some interactions are determined by whether the operator's attention is required. One of the challenges of humanoid robots is to interact with customers while acting intelligently. For a positive user experience and adoption, intelligence is needed for service robots to be able to respond and react to the environment without guidance from a controller (Ulrich, 2020). Intelligent robot characteristic also improves dimensions of HRI (Reis et al., 2020). It is important that the service robots are characterized according to the users' acceptance to avoid customers being uncomfortable during their interactions. A recent study found that as much as 61% of customers remain uncomfortable with the idea of interaction with robots (West, 2021). Within the HRI research field, attempts have been made to discover aspects that guests find important when interacting with robots. Bartneck et al., (2009) have compiled five key aspects that users find significant regarding HRI, namely, anthropomorphism, animacy, likability, intelligence, and perceived safety. A successful adoption of service robots depends on the satisfaction of the user (Bartneck et al., 2009). Therefore, it is crucial to understand the characteristics of the service robot that create positive perceptions from guests during service encounters.

Guests' perceptions

To evaluate users' perception, Bartneck et al., (2009) identified the five aspects as the Godspeed dimensions. The same authors applied the uncanny valley theory (Mori, 1970): a hypothesis that explains consumers' concern for services that include anthropomorphic characteristics. It indicates that if a robot is made more humanlike in its appearance and movements, the response from people becomes increasingly positive. However, when robots resemble humans too much, users' perception towards the robot turn negative (Strait et al., 2017). The Godspeed dimensions and the uncanny valley theory provide as ideal guidelines to evaluate guest perception. The Godspeed dimensions include anthropomorphism, animacy, likeability, perceived intelligence, and perceived safety.

Anthropomorphism

The physical embodiment is an important characteristic of frontline service robots because the appearance of a robot should be able to meet its perceived capabilities (Bartneck et al., 2009). Anthropomorphic or humanoid robots refer to service robots having mimic human characteristics and impersonate human behaviours to facilitate their tasks (Tung and Law, 2017). Anthropomorphism is measured by categories such as fake/natural, machinelike/humanlike, unconscious/conscious, artificial/lifelike and moving rigidly/moving elegantly (Powers and Kiesler, 2006). The design of the robot needs to be carefully addressed as highly anthropomorphic robots struggle with the 'uncanny valley' (Mori, 1970). A too humanlike appearance can cause expectations that the robot may be unable to deliver. To prevent dissatisfaction, it is important to pay close attention to the autapomorphic features of the service robots.

SRQ 1: How do guests perceive HRI evaluated through anthropomorphism?

Animacy

Animacy refers to the degree of being alive. Service robots that are perceived as being alive, can deeply involve users emotionally and will therefore influence their perception (Bartneck et al., 2008). Animacy can be measured by categories including, dead/alive, stagnant/lively, mechanical/organic, artificial/lifelike, inert/interactive, and apathetic/responsive (Lee, 2005). As service robots can behave in a certain matter, react to various stimuli, and adapt communication skills, they can be perceived as lifelike to a certain extend (Bartneck et al., 2009). To ensure that users do not perceive service robots as lifeless creatures, being alive is a fundamental criterion as it makes a distinction between humans and machines. By definition, service robots cannot be alive. However due to its movability and familiarity in its behaviour, it is unclear how humans perceive the robot.

SRQ 2: How do guests perceive HRI evaluated through animacy?

Likeability

The likeability measurement points out the positive impressions that guests might have towards service robots. It has been argued that by the way that people form positive impressions towards others is to a certain extent dependent on physical and social characteristic (Bartneck et al., 2008). Positive first impressions, often generate to positive interpretation of a person (Robbins and DeNisi, 1994). Prior research indicates that people can make accurate judgements about others within the first 30 seconds. Willis and Todorov (2006) found that even a tenth of a second is enough to make judgements. While making such judgements, people tend to be unaware of some oblivious or less obvious aspects. It can be assumed that people might judge robots in a similar way because robots are to some degree seen as social objects (Ghazali, 2019). The likeability dimension measures the first impression of the service robots. The categories consist of nice/awful, friendly/unfriendly, kind/unkind, and pleasant/unpleasant (Monahan, 1998). These judgements can influence consumers perception towards interactive robots.

SQR 3: How do guests perceive HRI evaluated through likeability?

Perceived intelligence

Interactive service robots are exposed to a great number of challenges. This mostly leads back to the field of AI. The way that service robots behave is based on their knowledge and learnings developed by AI (Bartneck et al., 2008). The main issue that AI faces is to imitate human behaviour. For service robots to be perceived as intelligent, it should be able to generate a certain intelligence level similar to that of a human. Perceived intelligence thus originates from AI and is measured through incompetent/competent, ignorant/knowledgeable, irresponsible/responsible, unintelligent/intelligent, and foolish/sensible (Warner and Sugerman, 1987). When a robot is employed in service encounters, it is able to educate itself and improve intelligence. However, in the hotel industry, the same encounters occur daily. For example, when a service robot is placed at the check-in encounter, and does a number of check-ins a day, the service robot will show less random behaviour as it has educated itself. This in turn leads to patterns which the user can perceive as intelligent (Bartneck et al., 2008). Such patterns will not lead to a problem solution as the robot is still limited to short interactions and users can become bored with its conversational and interactional limitations.

SQR 4: How do guests perceive HRI evaluated through perceived intelligence?

Perceived safety

A fundamental issue for guests interacting with service robots is safety. Robots do not consider the guests' perception of safety during their interactions (Bartneck et al., 2008). Perceived safety indicates the level of danger and comfort guests have during interactions. Safety is a critical issue to evaluate as recent studies have primarily focused on safety based on the robots perspective and not of a human. Having a positive perception on safety is key if robots are to be accepted in service environments. Determining the level of perceived safety is measured based on the categories of agitated/calm, anxious/relaxed, and surprised/quiescent (Kulic and Croft, 2007). It is important to take the customers feelings into consideration as the interaction with service robot could lead to discomfort or insecurity (Tung and Au, 2018).

SRQ 5: How do guests perceive HRI measured through perceived safety?

Gap and Relevance

As service robots are an essential and integral part of the customers perception on services, the influence that HRI has on hotels should be understood.

The literature study reveals that the customers have higher expectations towards a humanlike robot in comparison to a machinelike robot. Assuming that a humanoid service robot does not perform on par with the expected skills, a machinelike robots might be more advantageous. Although, the higher the expectations, the higher the disappointment that would increase in line with the level of anthropomorphism. So, there is a gap between customer expectations and customer perception towards service robots. For effective adoption of service robots, the hotel industry should understand the guests' perception and respond accordingly to help enhance positive perception of frontline service robots. The five Godspeed dimensions is a fundamental tool for evaluating customers perception towards HRI. The emphasis of this research will therefore be based on these elements. Investigating the perceptions of the customers on multiple service encounters that include HRI would provide foundational knowledge to understand the future of service robots in the hotel industry. Hence, the following sub research questions are relevant.

SRQ 1: How do guests perceive HRI evaluated through anthropomorphism?

SRQ 2: How do guests perceive HRI evaluated through animacy?

SRQ 3: How do guests perceive HRI evaluated through likeability?

SRQ 4: How do guests perceive HRI evaluated through perceived intelligence?

SRQ 5: How do guests perceive HRI evaluated through perceived safety?

were defined to help measure guests' perception on HRI. These five dimensions were turned into sub research questions which are stated above. Figure 3 visualizes the conceptual framework that will help to justify the research.

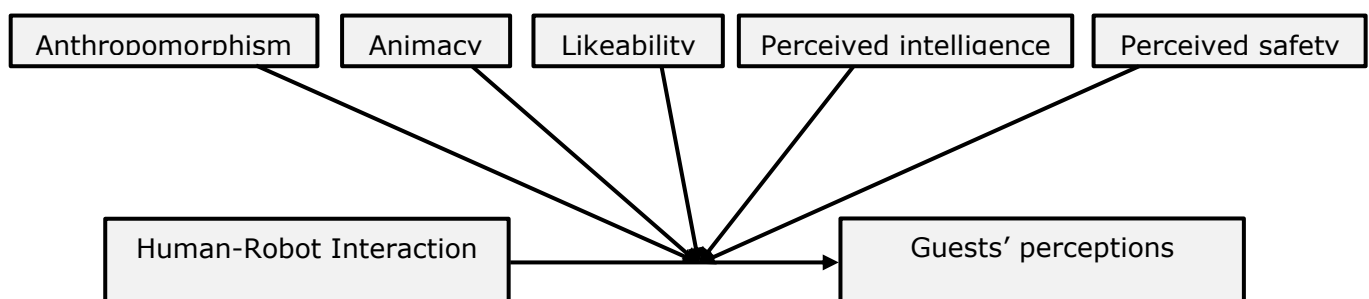


Figure 3: Conceptual framework

Methodology

Methods of data collection

The goal of the research is exploratory as the aim is to gain in-depth knowledge of the guests' perception towards HRI. A qualitative research design was chosen as it supports a resourceful analysis on guests' perceptions. The flexibility of qualitative research allows the researcher to evaluate the characteristics needed to help answer the MRQ. Both primary and secondary data was collected to ensure the reliability and validity of the findings. To gain insights on how consumers perceive a product, it is crucial to investigate those who have had the actual service experience with service robots. Therefore, analysing online guest reviews was chosen as primary data. Guests can convey, share, and reflect on a service using their own words. This is very useful and gives more detail on how guests genuinely feel during HRI. Secondary data was collected by conducting expert interviews. This was chosen to complement and contextualize the findings from the guest reviews. This allows for more in-dept knowledge to further address the MRQ.

Sentiment analysis on online guest reviews

Primary data was collected through analysing online guest reviews. A review left by guests are unstructured textual insights into consumers perception. Online guest reviews can be seen as an essential information source as it reveals true content on how customers really perceive a service (Bilro et al., 2019). Several hospitality researchers have recently applied sentiment analysis to examine consumers polarity in online reviews, including service ratings (Li et al., 2020), service quality (Ju et al., 2019) and guest attitudes/perception (Philander and Zhong, 2016). Sentiment analysis has thus been a successful method of data collection for extracting guests' perception.

Sentiment analysis was used to determine whether the guests' perceptions were positive or negative. The reviews were categorized into the five Godspeed dimensions and labelled positive or negative. A sentiment tool, namely MonkeyLearn, was adopted to determine the sentiment expressed by guests that experienced robotized service. MonkeyLearn produced two sentiment scores, one for positive sentiment and another for negative sentiment. The scores ranged from 0% to a 100% to indicate the strength of the sentiment. The reviews usually contained multiple sentences, in which some sentences were expressed positive, whereas other were negative. Therefore, each sentence was put in MonkeyLearn separately. Some of the reviews were analysed through the researcher's own interpretation as it did not express a clear sentiment in MonkeyLearn.

The data was collected from the three leading booking sites namely, Google, TripAdvisor and Booking.com (ReviewTrackers, 2021). Various booking sites were used for the reason that only a small percentage of those reviews focused on service robots. The analysis was therefore only focused on that percentage. The rest of the reviews were considered invalid as they led away from the scope of the research. For non-english reviews, google translate was used to translate them to English. All data was manually reported in MS Word.

Expert interviews

An additional method of data collection was necessary to gain more in-depth knowledge of all five dimensions. The second data collection method was collected through semi-structured, in-depth interviews. Whenever the goal of the research is exploratory, interviews can be considered the most relevant method of data collection, since more in-depth knowledge can be gathered (Gray, 2014). Semi-structured interviews allow for a two-way communication while maintaining structure and the ability to ask follow-up questions (ibid). This allows the researcher to gain insights and knowledge by questioning the motives behind the answers.

The number of interviews was not fixed as the researcher was simply looking for more in-dept insights on the five dimensions. Therefore, the researcher continued until the necessary data was provided. The experts shared similar answers, which provided a clear understanding for the researcher. The availability of the interviewees was chosen to set a certain time and date for the interview. Two interviews were held face-to-face to capture verbal and non-verbal communication, whereas the last interview was held through an online video call. This was due to the current Covid-19 pandemic as the participant did not want to meet face-to-face. The duration of the interview was not set but discussed beforehand depending on the availability of the interviewees. The structured elements of the interviews were the introduction of the research, followed by 15 open-ended questions supported by follow-up questions. At the beginning of the interviews, the interviewees were asked verbally give consent to record the interview. All interviews were recorded and conducted in English.

Population and Sampling

Sentiment analysis of online guest reviews

In spite the general question on how customers perceive HRI, there has only been a limited number of people who have experienced service robot applications in service encounters (Tung and Au, 2018). Therefore, the scope of the research is limited.

The year 2019 was analysed as it is the most recent year for which a full set of data is available. The reviews were selected from different hotels that employed service robots. The hotels include; Henn-na hotel, Aloft hotel, Yotel and Marriott. These hotels were chosen as they employed service robots at different service encounters, which allows to examine diverse encounters of HRI. As the sample size of this study is relatively small, the population included any hotel guests who have been in contact with service robots in the hotels aforementioned. The guests were not divided into target groups because if the research were to focus on a specific target group, there would be fewer reviews to analyze.

From the three review sites and the four hotels, 2487 reviews were found. However only 7,7% of those reviews reflect on service robots. The rest of the reviews were not considered as they are invalid to this study. The 190 remaining reviews were analyzed and labeled positive or negative. This might seem like a small sample size, but then again, only the reviews that mentioned the guests being in contact with a service robot are used. As service robots are recently being implemented in hotels, the sample size is just relatively small. However, to give a further breakdown on the guest review analysis, the reviews can be divided by the hotels analysed; Henn-na hotel Nagasaki, Japan (16,32%), Henn-na hotel Ginza, Tokyo (24,21%), Marriott, Los Angeles (17,89%) Yotel, New York (28,63%) and Aloft, Cupertino (12,63%), and from the review sites analysed: Google (42,11%), Booking.com (27,89%) and TripAdvisor (30%).

Expert interviews

A total of three interviews have been conducted. The participants were chosen based on their knowledge in the field of service robots and HRI. Given the fact that service robots are the scope of this research, taking experts within this field enables to gain valuable insights on the five Godspeed dimensions. Non-probability convenience sampling was applied. This method is known to be best suited for exploratory qualitative research (Taherdoost, 2016). In addition, they were chosen based on their availability and willingness to participate. The interviewees were found via LinkedIn and through the snowball effect. This means asking the interviewee for other potential participants. Table 1 provides an overview of all the experts that were interviewed.

Code	Interviewee	Professional Background	Relevant Experience	Transcription
I1	Roeland van Oers	Co-founder and Director of growth at WELBO. He helps customers with high-quality robotics software that improves business processes.	He has a lot of experience with service and how it can improve productivity.	Appendix 4.1
I2	Dominique Roos	Customer success manager at WELBO. She is an expert and researcher in human-robot interaction.	She has in-depth knowledge on human-robot interactions and consumers perceptions.	Appendix 4.2
I3	Stan	Human-robot interaction researcher and robot developer. He is making social robots even more social.	He is knowledgeable about the social aspect about service robots and researched/experienced human-robot interactions.	Appendix 4.3
MN	Interviewer	X	X	X

Table 1: List of Interviewees

Data Analysis

After the data was collected, the data needed to be analysed. The expert interviews were audio-recorded and transcribed. An AI powered transcription tool was used, called Otter.ai (Otter, 2021). The research themes were categorized based on the scope of the research and the SRQ that followed. Both the interviews and the online guest reviews were colour coded based on those themes. A different colour highlighted every theme, see table 2 for the colour codes.

The guest reviews were analyzed using the five steps of analyzing sentiment data. Figure 4 shows a graphical representation of this method.

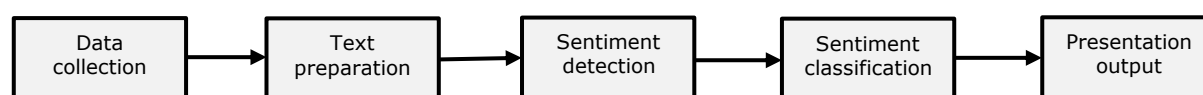


Figure 4: five steps of sentiment analysis
(Shankhdhar, 2021)

The **data collection** was collected from the three leading review sites. The reviews were categorized based on the five Godspeed dimensions. Thereafter, the data was colour coded according to the themes. When **preparing the text**, the unneeded data was extracted before analysis. This included filtering out the reviews that did not focus on service robots as those reviews were irrelevant to this study. When going into the **sentiment detection stage**, the reviews were examined to detect sentiment and to understand customers' perception on the five Godspeed dimensions. Subjective reviews were retained, categorized and colour coded. All relevant data was put in MS word and the reviews were **classified by sentiment** and labelled positive or negative. A sentiment tool, namely MonkeyLearn, was adopted to determine the polarity of the review. After the analysis was completed, the **output presented** will be put into useful information that can be presented to the client and other relevant stakeholders involved.

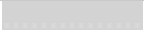
Colours	Category
	How do guests perceive HRI evaluated through anthropomorphism ?
	How do guests perceive HRI evaluated through animacy ?
	How do guests perceive HRI evaluated through likeability ?
	How do guests perceive HRI evaluated through perceived intelligence ?
	How do guests perceive HRI evaluated through perceived safety ?

Table 2: Colour Codes for Transcribed Interviews and Online Guest Reviews

Please refer to Appendix 3 for the analysis on online guest reviews.
Please refer to Appendix 4 for the transcribed expert interviews.

Findings

How do guests perceive HRI evaluated through anthropomorphism?

(The (#) indicates the review number, which can be found in the appendices)

Sentiment analysis on online guest reviews

Several guests have commented on the characteristics and humanlike behaviour of the service robots they have encountered. When it came to the humanlike aspects of the robots, many guests perceived the level of anthropomorphism as negative. "The scariest robot is the one that looks like a real woman." (5) "The female robot at the check-in counter was a little creepy." (33) "The hotel has robots on the reception which are spooky to deal with." (16) Notably, guests struggled with the 'the uncanny valley' theory when interacting with humanoids: "The front desk robot was too compatible with ordinary human beings which made my expectations too high." (6) "It might be disappointing if you expect everything to be the latest cutting-edge robot hotel." (177) It also made the guests uncomfortable: "It was somewhat uncomfortable to check in with a robot that looks like a human." (166) Nevertheless, reviews related to the mechanics reported: "Also, don't make the robot look like a human." (186) "There are various robots, but the dinosaur particularly was cute! They should make more robots look like animals!" (167). The dinosaur robot at the reception was very liked by children. "I enjoyed being welcomed by the dinosaur robot and it entertained my grandchildren." (182) "There was a dinosaur at the reception that the children really liked" (184). In terms of how the robots moved or behaved, comments such as "awkward" (91)(165) and "limited" (19)(22)(176) have been used.

(The (E#) indicates the code of the interviewee, which can be found in the appendices)

Expert interviews

The experts had similar answers regarding the anthropomorphic features of the robot. Interviewees mentioned, "What I have noticed is that people don't like robots that look too much like a human" (E1) "It shouldn't be too human" (E2). Particularly, the 'uncanny valley' theory has been pointed out in all three interviews; "People expect a lot from humanoid service robots, when a robot looks too much like a human you get the uncanny valley." (E1) "We have really high expectation of human-like robots and lower expectation with more machine-like robots, it should be too human like as you get the uncanny valley and you will be like oh I expected more." (E2) "a humanoid robot for example, if they really look like a human, you get the uncanny valley." (E3). Consequently, experts mentioned that the Pepper robot is most preferred for HRI; "It shouldn't make guests uncomfortable. What I see from our clients is that they prefer a small robot." (E2) "I think Pepper is the maximum that it should be." (E2) "So I think the pepper robots is a good example of a humanoid robot that guests really like. I noticed that guests' approach, a Pepper robot faster than a robot that really looks like a human because it rather scares them, and the Pepper robot is cute, and people want to talk to it so I would say that the Pepper robot is a good example of a humanoid robot." (E3).

How do guests perceive HRI evaluated through animacy?

Sentiment analysis of online guest reviews

Perceptions reflecting lifelike go along the lines of: "just two robots on check in who don't do anything but blink and slightly move their heads." (30) "The whole tech thing is a good marketing gig that's all. They do nothing, humans do the real work they say hello and goodbye, that's it." (32) "2 useless dolls are sitting at the reception; you still need to call a living person for check-in." (36) "The robot does not look active at all and it is just a decoration." (45). Nevertheless, some reviews were still positive: "Liked the android girls at the reception. They really look alive which made me curious to talk to them." (43). There is a little robot! It's so cool I liked how small it was and the way it moved around" (133) "AI is useful, I liked the way it moved, it was realistic." (168).

Expert Interviews

The lifelikeness tends to influence guests' willingness to interact with the robot (Bartneck et al., 2009). The experts suggest that it is important that the robot has realistic movements. For instance, "I think the fact that robots can move around through the space is very important, because it makes it more lifelike." (E1) "The robot should be facing you, like Pepper, it can follow your movements. And it should have proper head movement, so the user really feels like he/she is in a conversation." (E2) "it should have eyes and it should be able to face the customer directly when a customer talks to them. It should also have some kind of head movements so it can nod, so that the customer knows that he's actually listening." (E3).

How do guests perceive HRI evaluated through Likeability?

Sentiment analysis of online guest reviews

The overall perceptions of the guests indicated a positive likeability. Reviews mentioned the word "fun" several times (15)(16)(26)(37)(46)(54)(82)(90)(97)(106)(141)(150)(163)(167)(179)(183). Some reviews revealed that service robots were a convenience; "Check-in/check-out very easy and fast. Bonus: there are a couple of robots to welcome you every time you walk past reception!" (40) "I really like the self-check-in and check-out. It's very efficient." (99) "I love the antisocial of the hotel to check in with the robot check out" (107). Whereas other had a somewhat negative experience due to the lack of human contact: "Be prepared for the default check-in process to be a bit impersonal, as it is automated" (87) "When we got there we weren't greeted by anybody. We knew Yotel was a modern establishment which was run by 'robots'... so we had to check in by a silly tablet computer thing. In our heads we imagined being welcomed by a lovely hotel receptionist like in Home Alone, but no welcome...which made an impersonal experience." (96) "I enjoyed the robot, but I would not repeat it. I feel somewhat lonely." (186) "It may be very good for people who are not good at dealing with people, but I like people." (172) "Not getting used to check-in with robots, I was indebted to people." (173)

Expert interviews

Given the fact that service robots are recently entering the hotel doors, experts mentioned: "people are really surprised with what is possible." "People are amazed with the new innovations." (E1) "it is an additional experience." "The robot is a fun addition." (E2). However, for meaningful conversations, people still depend on humans: "it is an additional experience. But I also noticed that people expect too much and still rely on a human receptionist if they really want to have a meaningful conversation." (E2) "I really liked the robotic aspect of it, but I do think humans are still needed for the human touch because people can feel lonely." "People still rely on people." (E3).

How do guests perceive HRI evaluated through perceived intelligence?

Sentiment analysis of online guest reviews

Generally, the reviews revealed that the robots are not capable to have meaningful conversations: "The service was in the form that only humanoid robots corresponded to payment. Humanoid robots are not so intelligent." (6) "I imagined that the reception robots spoke all languages, but it did not speak French." (11) "Our interaction with the robots was minimal, but we enjoyed our stay there." (18) "The interaction is rather limited: I personally used them only for the check-out, which is very simple." (22) "Our experience was great, but if you stay here because of the robots, have in mind that the interaction with them is not as developed as it might be expected." (28) "The reception robots were hard to understand." (165) "Check in was interesting with the robots, however not practical as I had to repeat the check in process multiple times as the robot did not understand me." (181). Moreover, the guests were still in need of human staff: "The checkout procedure with the robot wasn't good. When I thought that the robot would handle it, it was done manually by human staff." (21) "If someone books to see how intelligent the robot is, then you will be disappointed. In fact, 2 useless dolls are sitting at the reception, you still need to call a living person for check-in." (36) "It is interesting because it is a robot reception, but sometimes it does not work, which is annoying. There is a staff button if you need real people to help." (161) "It is not enough for robots only. Even if you do not understand something, you cannot solve without calling the staff. Robots can't talk!" (178).

Expert interviews

Overall, the experts indicated that service robots are still not competent enough to have intelligent conversations: "I think they are not intelligent enough, but I do think it is an area where we will see massive improvement in the short term." (E1) "People think the robots are not working, but that is due to a lack of knowledge." (E2) "It is not yet smart enough to really have meaningful conversations. People think that the robot is able to talk and to speak several languages, or to feel emotions, but those are things that are not yet well done by service robots." "They do lack a bit of intelligence. It can be said that in a several years, they would be more intelligent." "People might be disappointed with the service that they get, because they're not as intelligent as they thought the robot would be. So there is a, indeed, as you said, a challenge in acting intelligently, but I think during time that could really be improved." (E3) Even though the experts mentioned the robots lack of intelligence, they suggest that robots could be more intelligent if people allow it to develop: "you should have a team working on making sure that the robot keeps being improved." (E1) "I think it is necessary that people allow the service robot to learn within their environment, that way the robot will enhance more conversation." (E2) "The staff, for example, is able to make the robots more intelligence. So, by placing the robot in several service encounters, for example, the robot can learn from the service and it can learn from conversations that it has." "Well, it can definitely acquire the knowledge and the skills needed. But like I said before, we need to develop the robots in their way of giving service and their way of interacting with people. They need to be developed in order to acquire the skills needed." (E3).

How do guests perceive HRI evaluated through perceived safety?

Sentiment analysis of online guest reviews

Some of the reviews revealed that guests were worried about their safety: "I was worried about being safe at a robot-only unmanned hotel." (1) "Don't check in in the middle of the night, it scary." (12) "It's hard because there are no people when I'm really in trouble." (160). Others perceived safety as a negative due to robots jeopardizing guests' privacy: "Figure that hotel accommodation is more about quality service and human touch. The feeling of security is important and therefore, it's creating a bit of insecurity when guest is surrounded by gadgets that suddenly talk to you ... which may or may not have camera." (174) "The voice recognition is inaccurate and it reminded me of Siri in beta phase if even that. Given the fact that most things around us these days are hackable, this thing offers no value other than having an extra set of microphone that listens to you at all time." (176).

Expert interviews

According to the experts, users do not question their safety in terms of privacy: "There are 1,2,3,4,5 devices in this room which are powered which have cameras and microphones, nobody ever mentions that or is afraid for their safety." "Of course, there are concerns around privacy that we need to take seriously, I'm not saying that we don't, but if you look at the people actually using the service, I've never had anyone struggling with their privacy." (E1) "I never had a customer that was afraid for these kind of things." (E2) "People haven't been worried about their privacy or anything like that" (E3). However, experts mention that guests could feel scared: "It could be a little bit scary not to have other people around just robotics." "They were a bit scared at night because they didn't feel so safe because there weren't a lot of humans around." "They moved around, and it was like being in a scary movie, one of the guests said." (E3).

Discussion and Conclusion

In this chapter the findings from the literature review, guests' reviews, and expert interviews will be discussed and compared. The similarities and differences found will then be concluded to answer each SRQ and, thus the MRQ.

Previous research discussed that the success of service robots relies upon positive perceptions of its user (Bartneck et al., 2019). A humanlike appearance encourages a positive perception towards HRI. However, people tend to have higher expectations on humanoid robots. In line with the uncanny valley (Mori, 1970), the findings discovered that a robot that looks too humanlike may not be ideal for interactions as users might find it uncomfortable. From the literature study it can be concluded that customers have higher expectations towards a humanlike robot in comparison to a machinelike robot. Meanwhile, the current findings mention the same. The Pepper robot seems to have positive perceptions for consumers. Hence, it can therefore be concluded that guests have a negative perception towards anthropomorphic robots. Instead, positive perceptions occur when interacting with robot who have machinelike characteristics.

Regarding animacy, literature states that service robots that are lifelike have a positive perception on the guest because it demonstrates a certain degree of personality (Lee et al., 2006). The guest reviews expressed that a small robot that has realistic movement gains a positive perception. This is in alignment with Ngan (2019) who discovered that movability, such as hand and head movement influences users' perception towards HRI. In addition, the experts mentioned that the service robot should be facing the guest while having interactions. Also, it should have eyes as it is imperative during a conversation. The eyes can create a positive perception during interaction. Therefore, one can conclude that a somewhat smaller service robot with proper head, eye and physical movement enhances a positive perception among guests.

Moreover, literature states that people form an impression towards another within the first 30 seconds, and those positive impressions (likeability) lead to more positive evaluations of someone (Robbins and DeNisi, 1994). The current study indicates that service robots create a fun experience for the guest. However, both the guests and the experts mentioned that guests still rely on people to perform a frontline service. It can be concluded that guests form a positive perception towards a service robot as it is a fun addition. Despite that, the perception turns negative when a service is completely carried out by a robot as it creates an impersonal experience.

Meanwhile, when robots are implemented in the hotel industry, limitations are likely to be noticed. All in all, service robots are not yet competent enough to have intelligent conversations. Guests expected service robots to speak several languages and they believed that services could be fully automated. However, they were still depended on human staff. In addition, earlier studies noted that service robots can learn what service is (de Kervenoael, 2020). In line with experts' comments, service robots should be educated to improve intelligence. The hotel staff, for example, can place the service robot in several frontline service encounters to learn from the conversations that it has. By means of multiple sensors, service robots are able to acquire the skills needed to adapt in evolving situations. Also, experts mentioned that due to AI, service robots will become more intelligence in the near future. To conclude, as long as the field of AI will not develop considerably, the intelligence level of service robot will remain very limited. Guests indicated a negative perception towards the intelligence of service robots as they are not yet competent enough to have meaningful conversations. Nonetheless, the findings suggest that service robots will gain intelligence if people allow it to develop over time.

Finally, for perceived safety, some of the guests perceived safety as negative due to robots jeopardizing guests' privacy. However, according to the experts, most guests are not aware of this. Therefore, the research cannot conclude if guests mind the invasion of their privacy. However, literature revealed that guests have an unfavourable attitude towards technology in general (Tussyadiah et al., 2020). Providing security is important to create a positive perception towards HRI. Guests did mention that having human employees in place ensures feeling of safety. Therefore, it can be concluded that supervision is required to handle defects or errors, ensure safety, and emphasize the improvement for HRI.

Recommendations

The hotel industry has shown keen interest in adopting service robots in frontline services. For guests to have a positive perception towards their communication with service robots, several recommendations can be given based on the five Godspeed dimension:

Anthropomorphism: A service robot should not look too human-like. A humanlike appearance tends to create higher expectations. In addition, a humanlike robot may not be ideal for interactions as guests find it uncomfortable. A positive perception can be enhanced with a humanoid robot that looks more machinelike than humanlike.

Animacy: A service robot should have human-like characteristics. A small machinelike robot that has realistic movement enhances a positive perception with eyes, head and location movement being the most important.

Likeability: Overall, guests have a positive perception towards service robots. However, the perceptions are only positive when the service robot is placed as an additional experience. The perceptions are negative when a service is completely carried out by a service robot as it creates an impersonal experience. Therefore, robots should complement the experience and not create the experience. Guests emphasize on the necessity of human employee assistance and human contact. Human service should remain available for the guests who want meaningful interactions. With that in mind, human employees and service robots should complement the experience.

Perceived intelligence: All in all, service robots are not competent enough to have intelligent conversations due to inadequacies related to language, as well as their ability to handle guests' requests. For this reason, perceived intelligence is negative. However, service robots can be educated to improve intelligence. Due to AI and the multiple sensors service robots have the ability to acquire the skills needed. In addition, the hotel staff will need to help educate the service robots by placing them in diverse frontline service encounters to enhance their communications. Therefore, human staff is still required. The researcher's recommendation would be for human staff and service robots to work side by side to enable service robots to gain intelligence.

Perceived safety: Not a lot was found in terms of guests' perception on security and privacy when communicating with service robots. Providing security is important to create a positive perception towards HRI. To provide security, it can be recommended to have human employees in place to ensure guests' safety.

Limitations and Further research

The current study is not without its limitations. When analysing the findings from the guest reviews, it was discovered that there was limited data. To compensate, the researcher thought of an additional data collection to enhance the research findings. Due to the novelty of service robots in hotels and the limited data available, an alternative way to collect data could have been a qualitative design approach. Questions could be asked through a survey, which could have targeted a larger sample of participants. Nevertheless, this research could initiate suggestions for further research. The present research gives an overview of positive and negative perceptions of guests during HRI, which can be of use for follow up research. In addition, as the current research did not focus on a specific target group, future research can perform a comparison with leisure or business guests who experiences HRI. Also, the perceptions of hoteliers or frontline staff can be examined, especially when tasks and working procedures have to be adjusted.

Limitations guest reviews

This study is limited as the design is limited by a small sample size. Not all hotel guests leave reviews. Hence, the results do not represent all guests who stayed at the investigated hotels. Second, online reviews are limited to details, and it is not possible to ask the guest to follow up on the review they left. Therefore, the reviews could be bias as it is interpreted through the researchers' perspective. Third, due to the scale of the research, the demographics of the guests have not been taken into consideration. It could have been that age, gender, nationality etc. could have had an impact on their perception. Fourth, only four hotels were used to collect data. The selected hotels were chosen based on the diverse service robots placed in different service encounters. However, there are more hotels featuring frontline service robots which could have revealed more guest perceptions. Fifth, this study collected data from the three leading booking sites, reviews could have been captured from even more platforms such as, Trivago, Expedia, Agoda etc. Finally, the hotel industry is not the only sector that employs service robots. Guests might have different perception towards HRI at airports, hospitals, theme parks and other service-related entities.

Limitations expert interviews

As the expert interviews were seen as an additional method of data collection, the time spent on collecting the data was limited as it was collected after handing in the proposal. Second, two of the interviews held were with experts from WELBO. This could be bias because they work in the same company. In addition, as WELBO is the only company in Amsterdam that sells service robots in the hospitality industry, experts were limited to find. Third, non-probability sampling was used which has a high sample error. Finally, the high vulnerability to section bias indicated influences beyond the control of the researcher.

Ethical considerations

The ethical challenge is that the hotel guests do not know their reviews are part of this study. If in any case a name or other personal information is given, participant privacy, anonymity and confidentiality is ensured. In addition, the recorded interviews were used in accordance with the interviewees. Furthermore, any deception or exaggeration about the aim of this research will be avoided.

Please refer to Appendix 5 for the Consent Form

Please refer to Appendix 6 for the Confidentiality Declaration

Chapter 3: Solution Design

The hotel industry is rapidly adopting service robots into their teams. As stated in this research, service robots were initially implemented to reduce waiting time, improve efficiency, and reduce labour costs. However, robots should build upon guests' staying experience. For robots to be accepted by the guests, it is necessary to have positive perception towards service robots and the interactions involved in the service. The current research provides an overview of the practical implications of hotels that employ service robots in frontline service encounters. To that end, there are several possible solutions.

First, it is important to reconsider humanlike robots. Guests' perception will be influenced by the anthropomorphic features of the robot. Humanlike robots are vulnerable to the uncanny valley effect. In addition, it makes guests uncomfortable. A humanoid robot with machinelike appearances is said to be preferred. The Pepper robot especially has a positive impact on willingness to interact. In addition, the Pepper robot has realistic movements that enhances a positive perception. Therefore, it is important to implement service robots according to the design preferences of its user.

The perceptions of the guests are negative when a service is completely carried out by a service robot as it creates an impersonal experience. For most guests, technology is still a tough nut to crack. The main concern is that technology takes away the human touch and the possibility of meaningful conversations. Within the hotel industry, humans will still run the show. However, that does not mean humans should perform alone, robots should be supporting actors. An automated frontline service makes it possible to improve efficiency and reduce waiting times. Therefore, hotels should invest in a partnership between human staff and robots to maximize efficiency and eventually the hotels revenue.

Service robots are not competent yet to have intellectual conversations. Therefore, guests have a negative perception towards HRI. However, service robots can improve their natural language by teaching it new words that enhances the vocabulary. It is important to have a team of human staff working on improving the service robot's vocabulary. In addition, as a hotel activity, guests could teach the service robots new words. If guests show interest in such an activity, the service robots will get smarter, and the guests happier. Nevertheless, AI will improve over time, which will eventually enhance the robot's intellectuality. Still, guests need to feel a sense of security when interacting with service robots. Safety and security issues could arise. Therefore, it is necessary for human staff to be able to intervene at any time during any conversation the robot is having. In other words, teamwork makes the dream work.

With that being said, the hotel industry and its customers will have to undergo a significant shift to accept service robots. For a positive guests' perception towards HRI, people and service robots will inevitably coexist.

To provide the stakeholders involved with the researcher's insights and learning outcomes on this novel topic, a whitepaper was made.

Please refer to Appendix 7 for the whitepaper

Chapter 4: Plan of Implementation

The whitepaper will serve as a theoretical contribution to hotels that intent to, or have employed, service robots. In order to reach hotels interested, the researcher has stayed in close contact with WELBO. The researcher has interviewed two valuable members of the WELBO team. While introducing them to the research topic, WELBO has shown keen interest in the outcome. WELBO has been supplying service robots since 2016 (WELBO, 2021). They have supplied the service robot, Pepper, in various services including, office spaces, municipal counters and elderly care (ibid). However, WELBO has not yet succeeded in implementing Pepper in the hotel industry. During the interviews, the interviewees have mentioned that the hotel industry in the Netherlands is hesitant to adopt service robots. This is mostly due to high investment costs, but also because hotels are afraid to lose customers due to their negative perception of technology and the impersonal service it delivers.

The whitepaper will provide as a suggestion what could be done to enhance customers perception, which might convince hotel managers to see Pepper as a worthwhile investment. If the hotels decide to adopt service robots, it will eventually help them to create a positive perception from guest towards service robots and their interactions. To implement the suggestions found in this current research, the researcher sent the whitepaper to WELBO via email.

Please refer to Appendix 8 for the emails sent.

The whitepaper suggests that human staff and service robots do better together in hotel frontline services. The hotel industry, its employees and its customer will have to undergo a significant shift to accept and incorporate service robots. Tasks and working procedures will need to be adjusted. Table 3 shows possible interventions for human-robot collaborations.

Human Employees	Service Robots	Intervention
+ builds upon guests' staying experience	- triggers feeling of being uncomfortable	Implement service robots according to the design preferences of its user
- Simple and repetitive tasks are performed by human employees	+ Leave simple queries and repetitive work to the service robots	Humans can focus on the attention and care guests yearn for. Meanwhile, service robots could save time and increase efficiency
+ Ability to have meaningful conversations	- Not yet competent enough to have intellectual conversations	Service robots can improve their vocabulary by teaching it words. This could be done by employees and technological /AI developments
+ Sense of security	- Safety and security issues could arise	Human staff should be able to intervene at any time
- Labour costs, costs of vacations and other benefit packages, compensation insurance, turnover etc.	- Purchasing service robots is an expensive investment	Think long term, the return on investment for robotics will create positive cash flow over the long term
- Need of training	+ upgradable	All software and hardware running in robots should be updated to the latest versions
+ can help the robot to acquire the skills needed	+ Provides better working conditions for human staff	Having both employees and service robots in place should improve efficiency

Table 3: Possible interventions for Human-robot collaborations

Chapter 5: Plan of Evaluation

As mentioned, this research will serve as a theoretical purpose. The findings and solution presented in the whitepaper will provide as a suggestion what could be done to enhance customers perception on HRI with service robots in the future. Service robots are still relatively novel at this stage. The current research and the whitepaper presented can be evaluated as a forward-looking research design. To that end, the current research can serve as a benchmark for further research.

The whitepaper has been evaluated by Dominique Roos, from WELBO.

Please refer to Appendix 9 for the evaluation form

The whitepaper given to WELBO has proven to be beneficial as this research is highly requested by hoteliers. If WELBO is able to gain hoteliers as clients, the performance of Pepper can be evaluated through the guests' perception. It would be beneficial to know whether the implementation of service robots improves guests' staying experience. To evaluate guests' perception on the five dimensions in HRI: anthropomorphism, animacy, likeability, perceived intelligence and perceived safety, a questionnaire can be used to monitor their progress. Bartneck et al., (2008) developed a questionnaire that evaluates the Godspeed dimensions. All dimensions can be evaluated through a 5-point Likert scale for example, Fake-Natural, Machinelike-Humanlike, and Artificial-Lifelike (ibid). This questionnaire can be used to monitor the progress of the service robots and to evaluate guests' perceptions, and whether perception changes over time to ensure a positive perception.

Please refer to Appendix 10 for the Godspeed Questionnaire

Chapter 6: Dissemination

Stakeholder identification

The dissemination process starts with identifying the stakeholders that could benefit from the outcome of this research. The stakeholders involved are WELBO, hoteliers and the academic research community.

The primary stakeholder is WELBO. WELBO aims to supply Pepper in various hotels in The Netherlands. However, WELBO has not been able to implement service robots in hotels yet but they intent to do so in the near future. They choose hotels that are innovating and most likely to implement service robots. Therefore, WELBO can be the middleman between the researcher's findings and the hoteliers. Furthermore, as the current research can serve as a benchmark for further research, academic researchers that are currently looking into the applications of service robots in the hotel industry can benefit from this research.

Acts of Dissemination

WELBO

As a first act of dissemination, the whitepaper has been sent to WELBO via email (Appendix 9). In addition, WELBO offered to forward the findings to hoteliers who have showed interest in welcoming Pepper into their team. To draw in an even larger audience that can benefit from the findings, a blogpost has been made and will be posted on the WELBO website in September.

Please refer Appendix 11 for the blog post and the article included in the blogpost

Academic Research Community

To disseminate the current research to academic researchers, prof. dr. K.V. Hindriks has been contacted. He is the full professor of the Faculty of Science, AI and Network Institute at Vrije Universiteit Amsterdam. Faculty of science is a place for education and research on science and AI (Vrije Universiteit Amsterdam, 2021). Together with his 'social AI' research group, Dr. Hindriks works on making robots more socially intelligent and making the interactions between humans and robots more natural (ibid). The Network Institute, of which Dr. Hindriks is also professor, is a research institution where research can be shared. The current research will be distributed in its entirety to Dr. Hindriks.

Please refer to Appendix 12 for the email confirmation

CPR Presentation to Peer Group

The current research is presented to the peer group by giving an in-depth explanation of the findings. This meeting was planned and carried out via Teams.

The Commissioner Ms. de Korte

The commissioner of this research is Ms. de Korte. She provided the peer group with the research topic, AI in the hospitality industry. To present the current findings a professional product had to be made. The whitepaper is the professional product of this research. The research in its entirety and the professional product have been sent and evaluated by the commissioner.

Please refer to Appendix 13 for the email confirmation and evaluation

Chapter 7: Academic Reflection

Due to the novelty of service robots in hotels, the main challenge of this research was to implement my findings. When thinking about the steps I have taken in LYCar, there are many things that I would have done differently. Within my internship I have implemented a marketing strategy (refer to Career Portfolio). When thinking back, it would have been better to do my research for my internship company. The delivered products were proved to be very valuable within my internship company and it was in line with the chosen PLO's. Therefore, the DBR approach could have been more appropriate for my internship company. This because the professional products made for the internship company have been based on a solution, and implemented accordingly.

The second challenge was the choice of data collection. Due to Covid-19 some research methods were out of the question. The first method of data collection was guest reviews. It was a challenge to find reviews relevant to this study. In addition, the sentiment analysis was new to me, which took quite some time to understand and to find an appropriate way to analyse. I analysed it by means of an AI tool, MonkeyLearn, which did not always analyse the reviews correctly. Therefore, my own interpretation was used, which could be biased. As I did not find as much relevant reviews as I had hoped, I applied an additional method of data collection. I choose to conduct interviews with experts within the field of service robots and human-robot interaction. Finding enough participants was a challenge. Only three experts have been interviewed. It could have been beneficial to have interviewed more experts. However, the three experts interviewed did have similar answers, which gave a consistent outcome to the findings.

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Appendices

Appendix 1: Executive Summary LYCar Proposal

Executive Summary

The Proposal part for LYCar will be performed for Ms. de Korte, lecturer at Hotelschool The Hague. The research should initially have a focus on the future of the hospitality industry with all its emerging technologies. My interest in this topic was found on the perspectives that people have towards HRI, which is an emerging theme within the field.

With this in mind, the goal of this proposal is to investigate the perceptions of customers on HRI during service encounters. This would provide clear insights to understand the future of service robots in hotels. When understanding the customers perceptions, this study can contribute to the hotel industry by examining the current findings, to suggest what could be done to enhance customers perceptions on HRI with service robots in the future.

The methodology will outline the way in which the research is to be undertaken. The research is going to be exploratory as the aim is to gain more in-depth knowledge of the guests' perceptions towards HRI. A qualitative research design will be chosen and primary data will be collected. A qualitative research design help support a resourceful analysis on guests' perceptions. As guests are able to express their thoughts on a service via reviews, an online guest review analysis is considered as an appropriate analysis. Online reviews can be seen as an essential information source as it reveals true content on how customers really perceive HRI. A thematic content analysis will be done on reviews from several hotels on several booking sites. The methodology is written as a plan to ultimately reach useable results in order to answer the MRQ. Therefore, the results mentioned in this proposal will be based the researchers assumption.

Depending on the results outcome, it seems logical to tackle the negative perceptions that customers might have towards HRI. When coming to grips with the negative perceptions, the customers perception towards HRI will ultimately be enhanced.

As this research is exploratory, the solution will not be actioned at a case company. However, it will provide a meaningful theoretical contribution to hotels that employed service robots. If used well, it can improve the perceptions that guests will have towards HRI. The findings and solution will provide as a suggestion what could be done to improve customers perception on HRI with service robots in the future.

Appendix 2: Assessment form LYCar Proposal

LYCar Proposal Grading Rubric

V.1.1 (Version LYCar 2020; 25 November, 2020)

Student Name:	Mireille Nije	LYCar Coach:	Dr. Govender
Student Number:	661623	Primary PLO:	2
Date Submitted:	08/02/2021	Secondary PLO(s):	9 & 10

Note: All boxes with red border to be filled by student

Preconditions (required for assessment)	Yes	No	Comments
Checks content and completeness			
Executive Summary is present, concise, can be read independently, contains information about process and content, focuses on results and outcomes	☒	☐	
LYCar Proposal meets formal reporting criteria (according to e.g., LYCar Reading & Writing Guide)			
LYCar Proposal is written in English and is professional, including common basic components such as Intro, ToC, Conclusion etc.- see Reading & Writing Guide	☒	☐	
LYCar Proposal is max. 5.000 words (counting after Table of Content, incl. text in tables) - visual proof of wordcount is included in Appendices.	☒	☐	

Harvard Referencing Style is used consistently, referencing to primary sources only, List of References is well presented



Check (technical) formalities and submissions

Ephorus upload



LYCar Proposal incl. Appendices are uploaded in Osiris



Ethics and data management

Ethical, integrity and data management requirements



Entitled to assessment? (All yes above required):



DD1: The student has demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that is supported by advanced textbooks

	Excellent	Pass	No Go
1.1 Use of literature and knowledge of the field	Student uses in-depth literature and knowledge of the field throughout the report. The report contains no mistakes and factual incorrectness.	Student uses in most cases literature and knowledge of the field in the report. The report contains some mistakes and factual incorrectness in a limited part of the report.	No sufficient or correct use of literature and knowledge of the field in the report. The report contains mistakes and factual incorrectness.
1.2 Intellectual depth and abstract thinking	Student takes all significant factors into account and looks from different perspectives, sees patterns, relates situations to concepts in order to solve larger problems. The reports show excellent thinking capacity of the student. New unique insights presented in the topic and depth of understanding displayed. Excellent linking between the elements and the underlying issues within the case situation.	Student takes different perspectives into account. The report shows intellectual depth (taking into account all significant factors and looking from different perspectives) in most parts of the report. Some patterns are clear. Some links have been made.	The report lacks intellectual depth (superficial and merely descriptive) in some parts of the report. Patterns are not sufficiently made clear.
Student Feedback:	Excellent ☒ Pass ☐ Not Yet ☐	Academic literature is used and applied well. To the best of my knowledge, no mistakes and factual incorrectness has been made. Significant factors have been taken into account to present insights of the topic. Links have been made throughout the report. As the given feedback was to state a gap and sub-questions, this has been done accordingly. The literature study itself has also been improved.	
Assessor Feedback:	Excellent ☒ Pass ☐ Not Yet ☐	EXCELLENT - In-depth use of high quality sources painting a broad landscape with the problem definition, and explaining key concepts in a detailed review of the literature. Consistent argument made throughout the review, creating a chain of evidence arguing for the need of the study, culminating in an identified gap in the literature that the study seeks to fill, well done!	

DD2: The student can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and has competences typically demonstrated through devising and sustaining feedback and solving problems within their field of study

	Excellent	Pass	No Go
2.1 Application of theories/models to situations at hand	Student uses a range of theories/models appropriate to the problems in the case skilfully and able to add their own unique perspective and insight. They own the model(s).	Student mentions a range of theories/models appropriate to the problems in the case and applying some of them in the correct way.	Mentioning models and theories but not using them in a correct way.
2.2 Possible impact and meaning of own work - dissemination of research	Student plans evaluation of impact and meaning of own work in relation to business and industry with sound underpinning. Identification of all stakeholders and acts of dissemination. Plan on how to effectively disseminate knowledge through different channels fitted for a variety of audiences is also presented.	Student formulates criteria for evaluation. Student describes possible impact and meaning of own work. Identification of stakeholders and planning of dissemination through at least one valuable channel with an audience is presented.	Student fails to describe criteria how to evaluate impact. No identification of stakeholders or realistic plan on dissemination of knowledge through at least one valuable channel with an audience.
Student Feedback:	Excellent ☐ Pass ☒ Not Yet ☐	Theories have been mentioned, not a lot. However, they have been added in my own perspective. The evaluation has been planned, however, it was quite hard to do so as the research is exploratory. Stakeholders have been identified. A planning of dissemination is given with one valuable channel. Then again, the research is exploratory, so it will serve as a suggestion, not as an execution. The dissemination was unclear, therefore it is stated how the findings will reach the stakeholders (email & blog post)	
Assessor Feedback:	Excellent ☐ Pass ☒ Not Yet ☐	PASS - More detail could be provided on dissemination of research concerning the who and the what. Relevant models and theories were discussed.	

DD3: the student has the ability to devise data gathering events, gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues

	Excellent	Pass	No Go
3.1 The Design Based Research Process	Student sets the research process up in a systematic and well organised way. Student makes sense of a problem mess, analyses a (complex) problem and formulates feasible solutions by using a design-based research approach. Logical flow from Problem definition to Analysis to Solutions Design/methods are well chosen and motivated,	Student analyses the problem, and formulates possible solutions underpinned by literature using a design-based research approach. Methods motivated and mostly logically chosen	Insufficient problem analysis and methodology, research cycle not used.
3.2 Analysis and evaluation of data	Student plans analysis and evaluation of data/information well using appropriate (digital) tools and makes data-driven decisions. All statements are underpinned with facts and figures and/or referencing. The appropriate tools are used in all steps. Analysis is sufficiently complex with use of information from more than 2 different dimensions (practioners, scientific literature, the organization and stakeholders).	Student plans analysis and evaluation of solutions clearly, with some flaws or unclarities. Some statements are underpinned with facts and figures and/or referencing, some lacking underpinning. Analysis is sufficiently complex using data from at least one dimension and sufficiently backed up with literature.	Plan of analysis and evaluation of solutions is not clear. Statements are mostly not underpinned with facts and figures and/or referencing; some are contradicting. No tools are used. Lacking or no analysis and not backed up with literature.
Student Feedback:	Excellent ☐	Pass ☐	Not Yet ☐
Assessor Feedback:	Excellent ☐	Pass ☒	Not Yet ☐

the research is systematic and well organized, the problem is clear, as well as the analysis and the solution. The information flows throughout the report. The plans of analysis is clear whereas the evaluation is quit vague, as it an assumption made by the researcher. All is well referenced. Methodology has been improved. The procedure of the analysis was unclear, the analysis has been clarified and the sentiment analysis has been applied and expained. a list of positive and negative words can be found in the appendix. a clearer sample size has been given. and lastly, the ethical consideration has been improved, all according to

PASS - Clear and logical setup of research methodology. Clear process for data analysis provided. More details need to be provided on how the online guest reviews will be evaluated e.g. time period etc. Solution design needs to be more robust and needs to lead into the Interventions. Interventions do not seem complete which need to address the problem in a hypothetical way. Perhaps the outcomes of the table can be integrated into a Guidelines document for Human Robot-Interaction for hotels which illustrate how to reduce the identified gaps.

DD4: the student can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences

	Excellent	Pass	No Go
4.1 Communication to audience making use of professional (business) English	Student divides information effectively in paragraphs/chapters. No noticeable errors in English usage and mechanics. Use of language enhances the argument and avoids abbreviations. Sentence structures are well varied, and voice and tone are highly suitable for the specific audience/s. Style and content complement each other into an appealing, high quality story. Highly skilful organisational strategy. The logical sequence of ideas increases the effectiveness of the argument and transitions between paragraphs strengthen the relationship between ideas. Sub-headings are employed effectively and the links between different sections are reinforced through linking expressions. Shows attention to detail in all parts of the report.	Student divides information in paragraphs/chapters. Errors in English usage and mechanics are present, but they rarely impede understanding. Use of language supports the argument. Sentence structures are varied, and voice and tone are generally appropriate for the intended audience/s. Generally, a clear organisational strategy. The sequence of ideas in most cases supports the argument and transitions between paragraphs clarify the relationship between ideas. The report is mainly comprehensively written and lacks some attention to detail in some parts of the report.	Distracting errors in English usage are present and they impede understanding. Use of language is basic, only somewhat clear and does not support the argument. Word choice is general and imprecise. Voice and tone are not always appropriate for the intended audience/s. Basic organisational strategy, with most ideas logically grouped. Transitions between paragraphs sometimes clarify the relationship among ideas. The report is not comprehensively written and lacks attention to detail in most parts of the report.
Student Feedback:	Excellent ☐	Pass ☐	Not Yet ☐
Assessor Feedback:	Excellent ☐	Pass ☒	Not Yet ☐

information has been provided through chapters.paragraphs. hopefully no english errors have been made. sentences are structured. its suitable for audience. The style and content clearly organized. arguments are supported. sub headings are employed. links are made. attention to detail.

PASS - Excellent writing style at the beginning of the report however this was not evident towards the end of the report particularly the evaluation and intervention which lacked depth and linkages.



DD5: the student has developed those learning skills necessary to continue to undertake further study with a high degree of autonomy

	Excellent	Pass	No Go
5.1 Plan on IQ development in PLO: Reflection on product(s)	Student has clear plans on what will be delivered and uses different relevant theory to underpin own work and reflect on it.	Student has a plan on what will be delivered and uses theory to underpin planned own work and reflect on it.	No clear deliverables mentioned and almost no theory to underpin own work and reflection.
5.2 Plan on AQ & EQ Self development	Student devises excellent ability to critically reflect on own developmental goals and demonstrates real growth mindset for life-long learning. Student proposes a demonstration of being able to self-direct, taking initiative in unpredictable situations. Student shows different metrics that can demonstrate development in terms of their EQ/AQ.	Student shows developmental goals and demonstrates growth mindset. There is a plan on how to reflect on values, attitudes and behaviour. Starting levels and desired end levels are described and measurements are provided.	Developmental goals are not concrete, there is no demonstration of growth mindset. Plan on how to reflect is vague and does not give enough substantiation to show growth.
5.3 Plan on EQ Social development	Student provides a plan on how to construct a multitude of proof that shows development as an Intercultural Hospitality Leader. Excellent ability to contribute to the global society/local community as a responsible citizen. Excellent analysis of diversity of people the student will deal with. Possible effective collaboration with all stakeholders in different cultural settings. Hospitality is key to the project or work the student does.	Student provides a plan on how to prove development as an Intercultural Hospitality Leader. Plan on how to contribute to the global society/local community as a responsible citizen. Proposing ideas on how to collaborate with different stakeholders in different cultural settings. Hospitality is a differentiator in the students' project or work.	No clear plan on development as an Intercultural Hospitality Leader. Plan on how to contribute to global society/local community is missing. Ideas proposed on collaboration or hospitality are not sufficient.
Student Feedback:	Excellent ☐ Pass ☐ Not Yet ☐	PLO goals are set. AQ and EQ have been tested using accurate tests. no clear plan has been given to contribute to the global society. As there was no plan to develop as a IHL, 5 steps have been applied to do so. It is not a very extensive plan as I was struggling with worldcount, but I hope that would be sufficient.	

Assessor Feedback:	Excellent ☐ Pass ☐ Not Yet ☐	PASS - More detailed reflection on EQ required, EQ assessment yielded basic results which were limited. Development goals need to focus more on Intercultural Hospitality Leadership - the cultural self analysis seems to be mostly rhetoric with little personal reflection.
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Overall Assessor Feedback

PASS - Still work needed on the latter stages of the DBR process however a much improved piece of work, with an excellent literature review being the result, well done!

LYCar Proposal Outcome

- Excellent ☐ All qualitative criteria awarded a "Pass" and at least two qualitative criteria awarded a "Excellent"
- Pass ☒ All qualitative criteria awarded a "Pass". "P" registered in Osiris. Student can continue with LYCar execution.
- No Go ☐ One or more qualitative criteria graded as "Not Yet". "F" registered in Osiris. Student re-writes LYCar Proposal with incorporated feedback.
- Pre-Condition NY ☐ Pre-conditions not met. Student resubmits LYCar Proposal. No grade or feedback provided to the student.

Appendix 3: Sentiment Analysis on Online Guest Reviews

#	Guest review text	Hotel	Review site	Godspeed Dimension	Sentiment
1	I was worried about being safe at night at a robot-only unmanned hotel, but I am surprised that there is a friendly front staff.	Henn na Hotel Tokyo Ginza	Google	Perceived safety Likeability	Negative Positive
2	The check in and check out process are with women robot that are really fascinating. The subway station is just 2 min walk and there is a family mart really nearby so that's really convenient.	Henn na Hotel Tokyo Ginza	Google	Anthropomorphism	Positive
3	Henn na hotels are modern and comfortable. The robotic staff may not work most of the time, but otherwise this is a nice hotel in a fairly walkable location not far from Tokyo station.	Henn na Hotel Tokyo Ginza	Google	Perceived intelligence	Negative
4	Checkout was easy because it is a robot. The rooms are quite large and the bathrooms are large and clean.	Henn na Hotel Tokyo Ginza	Google	Likeability	Positive
5	The scariest robot is the one that looks like a real women	Henn na Hotel Tokyo Ginza	Google	Anthropomorphism	Negative
6	I was looking forward to wondering how weird it was, but the front desk robot was too compatible with ordinary human beings which made my	Henn na Hotel Tokyo Ginza	Google	Anthropomorphism Perceived intelligence	Negative Negative



	expectations too high. The service was in the form that only humanoid robots corresponded to payment. Humanoid robots are not so intelligent.				
7	Friendly staff, Clean rooms and a handy location, all-in-all a pleasant experience. A little more robot interaction would have been nice	Henn na Hotel Tokyo Ginza	Google	Likeability Likeability	Positive Negative
8	The rooms are spacious for what is unusual in the city, the bathroom is standard. It also has wifi but also with a mobile Internet system that you can take out of the hotel. The receptionists are robots, this is a bit weird, but a human had to attend to us because there was a problem with the card payment	Henn na Hotel Tokyo Ginza	Google	Perceived safety	Negative
9	The receptionist (Android) has a sense of presence and bows when the checkout is over. There is also a human staff, so don't worry. There is a clothes refresher in the room. It is very close to Shintomicho Station and a convenience store is also close. The surroundings were very quiet.	Henn na Hotel Tokyo Ginza	Google	Perceived intelligence	Negative
10	nice hotel, very clean and good service.	Henn na Hotel Tokyo Ginza	Google	Likeability	Positive
11	I imagined that the reception robots spoke all languages, but it did not speak French. In addition, the check in was done by a	Henn na Hotel Tokyo Ginza	Google	Perceived intelligence	Negative



	human receptionist. Nevertheless, the hotel is very well equipped. The rooms are small but functional.				
12	Don't check in in the middle of the night, it scary.	Henn na Hotel Tokyo Ginza	Google	Perceived safety	Negative
13	There are 2 beautiful robot receptionists to checkin and checkout the guests. Very cool!	Henn na Hotel Tokyo Ginza	Google	Anthropomorphism	Positive
14	The room was good, but it took a lot of time to check-in for the convenience of the system and it made me tired.	Henn na Hotel Tokyo Ginza	Google	Likeability	Negative
15	Meet android at the reception! it was fun.	Henn na Hotel Tokyo Ginza	Google	Likeability	Positive
16	We spent 5 days in Tokyo on route to Sydney. We stayed at the Henn Na hotel which is located close to the center. The hotel has robots on the reception which are spooky to deal with. My wife had fun talking to the bots. The hotel was good value for money. Clean and good to be close to everything. Be aware that the metro rail does not have many lifts. We had to carry our luggage up a few flights of stairs. On the return leg we found an escalator but we still had to lug our cases up more stairs. Tokyo is a great, friendly and clean city to visit. Be prepared with cash, not all shops and businesses take credit/debit cards.	Henn na Hotel Tokyo Ginza	TripAdvisor	Anthropomorphism Likeability	Negative Positive
17	The staffs were very attentive and could speak english. It is very	Henn na Hotel Tokyo Ginza	TripAdvisor	Likeability	Positive



	convenient to go anywhere from this hotel. Tsukiji market is just 10min away. There is a konbini nearby and a Chinese restaurant. I love the LG styler. It is so convenient and useful, unfortunately I learnt to use it on the second last day hahaha. The beds and pillows were kinda hard but everything else was fine.				
18	The Henn Na "Robot" Hotel caught my eye due to the realistic robots that serve as the front desk staff. Our interaction with the robots was minimal, but we enjoyed our stay there. The hotel is very clean and modern. The rooms are small (typical of Japanese hotels) but my kids (8 and 10) and I each had our own twin bed. The beds were comfortable enough but the pillows were kind of hard for my taste. There is only room for a desk and the laundry steamer. No closet and no American coffee maker. The best part of staying at Henn Na is the location. Walking distance to Tsukiji Market, close to Ginza, and steps from Yurakucho and Hibiya subway lines. There is a Family Mart one door down and 7-11 around the corner for supplies and quick breakfasts. There is a small cafe in the lobby but we didn't eat there. The staff was incredibly helpful and spoke English proficiently. Definitely an	Henn na Hotel Tokyo Ginza	TripAdvisor	Perceived intelligence	Negative



	affordable choice in an excellent neighborhood if you don't mind a simple hotel.				
19	We chose this hotel because we heard it was the infamous Robot, high tech hotel however it was not worth it. There are 2 lifelike robots at the front desk that have VERY limited functions. If you really want to see them just go into lobby and take a peak. The only other piece of technology was the LG clothing freshener. It did work to take the wrinkles out. Otherwise the rooms were basic but clean and the breakfast that's included was a sweet veggie sandwich. Location is good as it is about a 20 minute walk to Ginza crossing. Overall a disappointing experience because we were expecting high tech.	Henn na Hotel Tokyo Ginza	TripAdvisor	Animacy Perceived intelligence	Negative Negative
20	I stayed here for 2 nights at Cospa because of the good access. About 10 minutes' walk to the outside of Tsukjiji. It was convenient to walk to Ginza. There are convenience stores and Daiso, so it was really helpful. There is a robot at the reception, so if I was trying to check in, the staff would come out and help, usually by humans. The room was very clean and easy to use. All the staff were kind and lent me an umbrella and kept my luggage. The checkout procedure with the robot wasn't good.	Henn na Hotel Tokyo Ginza	TripAdvisor	Perceived intelligence	Negative



21	When I thought that the robot would handle it, it was done manually by human staff. It was a double room because I couldn't get a twin room. The room was clean because it was new, but it was clearly small. But the bed was double, so it wasn't as cramped as I expected to sleep.	Henn na Hotel Tokyo Ginza	TripAdvisor	Perceived intelligence	Negative
22	The hotel is located in Ginza, certainly one of the most prestigious and interesting areas of Tokyo, but slightly away from the centre (for example, the Tokyo Plaza Centre is over a kilometre away). It is a robot hotel and at the reception you are greeted by two robot with an elegant feminine appearance. The interaction is rather limited: I personally used them only for the check-out, which is very simple. For any good account, very kind humans are always available, also with an elegant feminine appearance. Otherwise, it is a normal hotel with sufficiently spacious and well-equipped rooms. Particularly appreciated was the availability of a mobile phone in the room which also allows easy use of the hotel functions. Weak point is the breakfast, decidedly shabby and moreover served in an uninviting place.	Henn na Hotel Tokyo Ginza	TripAdvisor	Animacy Perceived intelligence	Positive Negative
23	The hotel was nice, pretty classy and very near two train stops. The	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Negative



	staff was very nice and let us leave our bags after checkout with no problems. The room was small but nice. The robots at the entrance were cool, but very underwhelming, I wouldn't stay just for them because they didn't do much, but the rest of the hotel is good.				
24	Breakfast offered a good choice of western and Japanese food. Sadly, the robot receptionists were not working.	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence	Negative
25	Close to a metro stop and easy to find. Rooms were small, but well equipped. Staff, both human and robot were helpful. There was no in room robot that we thought there would be (from tv documentaries that had visited). Shame the check in wasn't fully automated by the robots. didn't pay the extra for breakfast and then struggled to find breakfast places nearby	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence Perceived intelligence	Positive Negative
26	The robot element is excellent and great fun (we also had 'real' staff to help with luggage transfers.	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Positive
27	Robots at check in were quirky although they have problems with foreign credit cards. The clothes steamer in the room was amazing and very useful for giving clothes a refresh after being stuffed in a suitcase. It would be good to have an opinion to have the room cleaned without having the towels	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence	Negative



	replaced with fresh towels, to save water etc.				
28	Kind staff, very helpful. Small room and bathroom, but with all the needed amenities. They even have a fridge-like machine that refreshes your clothes and other useful technologies. Perfect location, you are practically in the city centre and at a walking distance from Tokyo Station. Also, there is a metro station right next to the hotel. The robots are really interesting, a completely new experience for us. It is a good hotel and famous because of its robotics. Our experience was great, but if you stay here because of the robots, have in mind that the interaction with them is not as developed as it might be expected.	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence	Negative
29	The real staff is great the robot however not so much, very disappointed.	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Negative
30	Very clean and modern. Bed was very comfortable. Clothes steamer in room was really handy. Staff were helpful. Close to fish markets. Less robots than advertised- just two robots on check in who don't do anything but blink and slightly move their heads. Check in machines didn't accept international cards so staff helped us check in.	Henn na Hotel Tokyo Ginza	Booking.com	Animacy Perceived intelligence	Negative Negative



31	All amenities and facilities inside the room were working well. Location is good - close to subway station. Staff were friendly. Robot concierge did not work as expected. Manual on how to use the robot should be provided. Staff were friendly and helpful; however would be even better if they can speak conversational English.	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence	Negative
32	Location was good, right next to two metro lines, and an OK 15 min walk to Ginza. Though the Robot thing is a farce. The whole tech thing is a good marketing gig that's all. They do nothing, humans do the real work they say hello and goodbye, that's it. Room is a 2-star room at best with some gadgets that takes 20 pages of manuals to figure out. And when you do figure out how to cast onto the TV faces a wall not you, fun... Walls are thin, could hear everything next door, room small and housekeeping should be given real vacuum cleaners do not dust busters, I am allergic to dust mites and had to pop a good few pills to survive the night. My advice for the money you can find much better in the area by far!!	Henn na Hotel Tokyo Ginza	Booking.com	Animacy	Negative
33	When I offered to change the room, he was willing to change it. We kindly responded to any problems with the payment card. The facilities and equipment in the	Henn na Hotel Tokyo Ginza	Booking.com	Perceived safety Anthropomorphism	Positive Negative



	hotel are very clean. It may be difficult to get directions at first for those who do not know the land, but this price is the best cospa because of the long-established walk in Tsukiji, the quiet environment, and within walking distance of Ginza (although we are bright in the Ginza area). I felt it was a hotel. The elevator is a card key type, which gives you a peace of mind in terms of security. I saw many female customers. There is also a vending machine and washing machine on the first floor. It is an inn with a lipi. The female robot at the check-in counter was a little creepy. It may have an impact on the hotel				
34	The latest equipment was available. Disliked the reception robot machine was out of order.	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Negative
35	Clean service good with bathtub. The counter robot is a bit scary and I was looking for the light switch for a long time.	Henn na Hotel Tokyo Ginza	Booking.com	Anthropomorphism	Negative
36	Quite spacious room compared to many at this price point. Cool wardrobe. YouTube works on TV. The room has a smartphone, from which you can distribute WIFI. Overall clean room, close to the main street on Ginza. Next to the FamilyMart store. Good breakfast buffet style. There is a self-service laundry - laundromat. Self-service laundry such a feeling that it does	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence Animacy	Negative Negative



	not wash, it is written that you do not need to add powder - in fact, very little detergent is automatically added. Well, this is more like advice, it is better to take a washing capsule and throw it into the drum) If someone books to see how intelligent the robot is, then you will be disappointed). In fact, from robots - 2 useless dolls are sitting at the reception, you still need to call a living person for check- in.				
37	The robot element is excellent and great fun (we also had 'real' staff to help with luggage transfers). The beds were very hard.	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Positive
38	The room is clean and comfortable. The bath is wide. The front office robot seems to have made little sense.	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence	Negative
39	The reception for booking was a waste of time having the 2 robots.	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Negative
40	Location was great. Walking distance to multiple public transit stops, but slightly off the beaten track so it is nice and quiet. Staff was incredibly friendly. Check-in/check-out very easy and fast. Bonus: there are a couple of robots to welcome you every time you walk past reception!	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Positive
41	Close to a metro station. For a robot hotel this was the least technological hotel we stayed at during our trip. The robots in the lobby do not check you in. They	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence	Negative



	just stand and blink at you. This hotel may have been at the forefront of technology 10 years ago, but has not move forward. We booked a room for three people which turned out to be tiny. If the hotel cannot offer a proper size room, they should not say that they can. Nowhere to put clothing/ luggage at all. Suitcases had to be left open on the floor and toiletries had to stay on the bathroom floor. The beds were uncomfortable. We stayed in a total of five hotels during our trip to Japan and this was the only one we were disappointed with.				
42	The hotel has all the necessary amenities and is well located. No need for robots, they are only at reception and do not interact with customers... I was very disappointed with this point	Henn na Hotel Tokyo Ginza	Booking.com	Perceived intelligence Likeability	Negative Negative
43	Liked the android girls at the reception. They really look alive which made me curious to talk to them.	Henn na Hotel Tokyo Ginza	Booking.com	Animacy	Positive
44	It is a really convenient location and the robot service at the check-in counter is amazing.	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Positive
45	Convenient to take a taxi to Ginza, Tsukiji and Nihonbashi. The robot is not look active at all and it is just a decoration. I want you to leave a laundry bag. The bed is very hard. Pillows are low without	Henn na Hotel Tokyo Ginza	Booking.com	Animacy	Negative



	one more pillow. Bedding is generally out.				
46	Very helpful staff and the robot option was lots of fun. Three beds together were quite close in one hotel room. It was fine, but a little tight.	Henn na Hotel Tokyo Ginza	Booking.com	Likeability	Positive
47	Robot room service!	Aloft Cupertino	Google	Likeability	Positive
48	Very modern feel like the rest of the chain. They had a nice bar and drinking areas. It had a good pool table for guests which was free to play. There was also this robot that would deliver stuff to your room, kind of weird to run into in the halls but pretty cool.	Aloft Cupertino	Google	Likeability	Positive
49	The place is at a convenient location. The swimming pool is a nice perk. However, I wish it was well maintained. The carpets in the corridors are badly stained. A robot literally delivers stuff if you need something. A nice touch I would say.	Aloft Cupertino	Google	Likeability	Positive
50	Everything was nice and modern. Very clean as well. My favorite part was Botler Pepper the robot, it could talk, look at me and follow me which was impressive and cute. My only complaint was the bed. It was	Aloft Cupertino	Google	Anthropomorphism	Positive



	extremely firm and uncomfortable. The pillows felt like plastic bags. Had a really hard time sleeping.				
51	Stopped in with a work group to check out their delivery robot. The manager was very accommodating and didn't rush us at all even though we weren't staying at the hotel. They have a robot that they use for delivery to the room and have named it the Botlr.	Aloft Cupertino	Google	Likeability	Positive
52	Always consistently clean and modern. There's a cool robot butler named Botlr. Aloft is always consistent about their rooms as well. Great location. Limited garage parking. Great gym and pool.	Aloft Cupertino	Google	Likeability	Positive
53	Aloft had a good room layout, good parking, and good service. The Pepper butler service robot is a really cute, and I admit we looked for an excuse to use it. The mattress in my room was extra firm, which was great for my husband (back-sleeper) but terrible for me (side and stomach sleeper). The walls are thin and you can hear doors loudly slamming whenever someone goes in or out of a room. One of our top	Aloft Cupertino	Google	Anthropomorphism	Positive



	reasons for staying here was the promised ability to access our Netflix account on the tv. This is done through Apple TV, so will be much easier on an idevice than an android. However, we weren't able to stream at all due to our room's individual wifi not working. A support ticket was created and escalated, but our stay was too short to resolve the issue.				
54	A good clean, fun hotel with a robot delivery service! Good value for money in an otherwise pricey area.	Aloft Cupertino	Google	Likeability	Positive
55	Great stay, Cute Savioke robot, adding a hot tub would have made it perfect!	Aloft Cupertino	Google	Likeability	Positive
56	Convenient location for silicon valley. Rooms were spacious and exactly what you would expect. Bed was comfortable. The best part of the stay is they have a robot called botlr that will deliver bottles of water to your room. It was so delightful - like having C3PO stop by!	Aloft Cupertino	Google	Likeability	Positive
57	Clean rooms. Robot service. Pet friendly!	Aloft Cupertino	Google	Likeability	Positive
58	This is an amazing Aloft hotel. The design was great and there's even a robot!	Aloft Cupertino	Google	Likeability	Positive



59	Loved the lobby and patio, and Botlr, the robot. Staff was accommodating. Pet friendly!	Aloft Cupertino	Google	Likeability	Positive
60	Outstanding customer service at the front desk and bar - highly appreciated. Enjoyed the pool billiard table. Also a super funny gimmick / room service by a robot who brought water and popcorn. Rooms clean and appropriate - well equipped. All in all quiet business hotel.	Aloft Cupertino	Google	Likeability	Positive
61	Nice rooms, very modern and comfortable. Awesome room service robot, wish we could have used it, called the office and ordered more towels and he called back an hour later at 11 PM asking if we still wanted them. Really?	Aloft Cupertino	Google	Likeability	Positive
62	Updated to a five as I remembered that the service was so stellar, they only deserve a five!! This hotel was very reasonably priced. I didnt give a five star because the noise from the hallway needs to be addressed and they didnt accommodate my request for a courtyard view. They have a cool robot that delivers requested items! The beds were comfortable and the rooms were clean. I checked in at night and the girl was sincerely friendly. The	Aloft Cupertino	Google	Likeability	Positive



	housekeeping staff greeted me with a smile and made me feel welcome. The surrounding area seemed safe and there are plenty of places to eat. I will definitely stay here again.				
63	You know that a hotel is a little different from the usual kind when your very first experience after check-in is sharing an elevator with the hotel's robot that happened delivering something to another guest's room! (Yes, the hotel has a sort of R2D2-looking robot that it uses to deliver towels, etc. to guests' rooms when they call down to request them.) So obviously this hotel aims as modern "hi-tech" sort of ambiance, as one might expect of a newish place in heart of the Silicon Valley, and it does pull that off quite well.	Aloft Cupertino	TripAdvisor	Likeability	Positive
64	Enjoyed the stay and the room was OK. I was very impressed by the robot downstairs, who would bring things to guests' rooms if they left them in the bar or lobby. I rode in an elevator with said robot, and enjoyed that very much. That said, I'm not a millennial, and I find I prefer a hotel with a hotel room a bit more elegant	Aloft Cupertino	TripAdvisor	Likeability	Positive
65	My daughter and family got a huge thrill out of meeting the robot that would deliver items like clothes hangers and cups. Undeniably cute	Aloft Cupertino	TripAdvisor	Likeability	Positive



	in case you forgot you were in the hub if Silicon Valley.				
66	bit different than the usual aloft design, but the slightly larger room and the underground parking were great. hotel location is excellent for visiting the apple campus and the apple park. the delivery robot was cute, and apple tv in the room was a nice touch.	Aloft Cupertino	TripAdvisor	Likeability	Positive
67	I really enjoyed staying at this hotel. It is brand new and beautifully designed. My room was very nice. I loved the fact that a robot could deliver things like water or toothpaste to your room. Super cool! Staff was very kind too. The only thing I did not like is lack of food and room service in the hotel. Apart from that, everything was good	Aloft Cupertino	TripAdvisor	Likeability	Positive
68	The room has relatively simple design, and the dark colors makes it look chic. My favorite part was that the robot delivers your orders to the room. It was so cute! Kids would definitely get a kick out of it.	Aloft Cupertino	TripAdvisor	Likeability	Positive
69	This Aloft was extremely clean, chic, and modern. They have most up to date technology in all the rooms and a robot "butler" that brought me items to my room, very cool! It is wonderfully decorated and they had charging so I could charge my car. So many amenities! Whenever I asked for something the hotel staff gladly	Aloft Cupertino	TripAdvisor	Likeability	Positive



	helped me and took very good care of me. Thank you everyone at Aloft, you really made my stay here memorable.				
70	Ultra modern setting. The robot delivery facility was very cool.	Aloft Cupertino	Booking.com	Likeability	Positive
71	Meh. The robot concierge is pretty cool, even though he's stealing our jobs	Yotel	Google	Likeability	Positive
72	Small, but quite functional rooms with good City view. Restaurant is not bad. Yobot (the robot handling your luggage) was broken, so we did not manage to test it. The room was a bit "preloved". But location is really cool and close to all the popular sightseeings.	Yotel	Google	Perceived intelligence	Negative
73	Very comfortable room. It is designed to be very compact, but everything is ready to be practical and pleasant: excellent natural lighting, furniture designed to place all the imaginable gadgets and sliding bed so that during the day it does not occupy so much space and fulfills almost armchair functions. It is a modern hotel to the maximum: a robot saves the luggage and is checked in personally on the computer, although there are	Yotel	Google	Likeability Perceived intelligence	Positive Negative



	staff to support in case of doubt,				
74	Modern and original hotel. Very small but fully functional "cabin" rooms, with shower, iron and board. TV. Automated Checkin service. Robot for luggage. Reception. RoofTop terrace with good views. Very close to Times Square, Hellskitchen and Hudson Yards.	Yotel	Google	Likeability	Positive
75	Modern hotel with charm. The robot at the entrance is spectacular. To be in Manhattan the price is not bad with breakfast (coffee and muffins) included. I would not mind repeating. It was our honeymoon hotel and I keep an unforgettable memory.	Yotel	Google	Likeability	Positive
76	Cool view and a funny robot in luggage storage.	Yotel	Google	Likeability	Positive
77	Really liked this hotel. My room with a queen bed was very small but smart organized, so it was pretty comfortable for two people. The view was absolutely fantastic both at days and nights. There was a gym in the hotel but I had no chance to try it. Also they had the Yobot on the ground floor:	Yotel	Google	Likeability	Positive



	cute robot which can keep your bags.				
78	This was our first time in New York City with my family, I can say that Yotel made an amazing time for us staying at this hotel since the first day on Saturday before checking in and our last day on Wednesday of the following week. They have an amazing technology a robot where you can leave your luggage during the day before going to the airport, before and after checking in or out.	Yotel	Google	Likeability	Positive
79	10 minutes walk to Times Square! Nice robot at the entrance and do-it-yourself check-in. A card will be used for the use of the lift and entrance to the rooms. A futuristic style spaceship hotel. The rooms are really small but just as functional, size is never a problem because in a city like NYC you certainly don't have to enjoy a hotel room. It should also be said that for holidays from 7/10 days onwards they could be miniscule. The rooms are super soundproofed and the cleaning is really impeccable!	Yotel	Google	Likeability	Positive
80	Neat look, feels like being in a space station. Check in, out and	Yotel	Google	Likeability	Positive



	checking baggage is all by robot.				
81	Hotel is good. The robot for the luggage is a nice gimmick but too slow. Breakfast really is worth the money. But you should never take a standard room. These are too small (8sqm), and the smell after old sweat.. Better always go for a queen size bed room (+15sqm)... Then absolutely great.	Yotel	Google	Likeability	Negative
82	Love the aesthetics of this hotel. The luggage storing robot was especially fun!	Yotel	Google	Likeability	Positive
83	A great experience, especially the baggage robot.	Yotel	Google	Likeability	Positive
84	A hotel where robots are working but people are not. It was very interesting as a function of the hotel. The design of the hotel and room was good.	Yotel	Google	Likeability	Positive
85	The hotel is a nice place, a great experience for those that want to try something different (having self check-in, Robot Assistants and a very futuristic experience. Near so many great restaurants in Hells Kitchen. I would say that the hotel is totally recommendable	Yotel	TripAdvisor	Likeability	Positive
86	Our first time in N.Y.C was made even more memorable by this great hotel. Clean, fresh and the	Yotel	TripAdvisor	Likeability	Positive



	friendliest staff you could ask for. the robot luggage storage was a great way to store our luggage and not having to haul our stuff through the busy streets was a blessing. The breakfast was cheap and had a great spread of both hot and cold items. And the view..... the view we had from the 11th floor was incredible and was a complete surprise! We have already decided to go back to N.Y.C and Yotel is where we will be staying once again. i cannot recommend this hotel enough as a first time traveller, it was in every aspect, the perfect place to stay. 5 of the shiniest stars for this place.				
87	Be prepared for the default check-in process to be a bit impersonal, as it is automated on the self-serve kiosk or digital via the app. If you need a "human" to help you out, you need to seek them out. At the same time, the robot that stores the luggage in the front foyer is pretty cool.	Yotel	TripAdvisor	Likeability Likeability	Negative Positive
88	We were 5 nights at YOTEL. The location was perfect, from there all spots in New York are good to reach. By foot or through the Metro. The rooms are clean and comfortable for what we needed. Also the check-in and check-out are fully self-service. Also very handy is the Yotel luggage robot.	Yotel	TripAdvisor	Likeability	Positive



	There you can store you luggage for only 2 dollar each				
89	With walking distance of many Manhattan hot spots such as the high line, Broadway and Times Square, Hell's Kitchen, and the fashion district. Loved the Yotel robot, kitschy decor and the meditation channel on the Yotel TV.	Yotel	TripAdvisor	Likeability	Positive
90	Developed as a small hotel for people needing a place to sleep at an affordable cost, Yotel fits the bill. The rooms are clean and well maintained and adequate for 2 people to stay comfortably for a few nights. Minimally staffed but were helpful and friendly. Luggage storage is fun with a robot.	Yotel	TripAdvisor	Likeability	Positive
91	The automation was no real problem for me - checking in was easy. The cabin was small, but functional, clean and comfortable. Checkout had one awkward moment where it took my card and then said it didn't know who I was - ended up not being a problem. The one real problem I had was storing my luggage on the last day. The little robot only works on cash. I don't carry cash, and I don't carry a way to acquire cash. I realize this might put me a little out-of-step with normal, but hey, I think I'm just ahead, and shouldn't	Yotel	TripAdvisor	Likeability Likeability Perceived intelligence	Positive Negative Negative



	an automated hotel be ahead with me? If it can't take a credit card it would be nice if it could add the \$2 to my bill. Honestly, I wasn't fussed about the \$2 cost, but really out of luck in terms of not having cash to offer. None of the staff had any alternative and didn't seem too concerned that this meant I'd have to lug my luggage around all day - consensus seemed to be that it was my problem. So, at the end of the day, I'd say this is an ok place to stay, but you better not run afoul of whatever they consider 'normal' to be, because that probably isn't going to get you a useful response. And, if you want to store your luggage, you had better have \$2 in cash.				
92	We were pleased when we arrived at Yotel in Manhattan. My husband and I stayed 5 nights. It's a cool modern atmosphere geared towards younger people as I couldn't picture my parents enjoying the decor or feel of the place. Purple lights everywhere! Check in was quick, check out is done at a kiosk and a huge robot will store your luggage for you if you like. Yes, a robot. The location is superb! Walking distance to everything in midtown.	Yotel	TripAdvisor	Likeability	Positive
93	I have no words to describe how happy I got when I got to the hotel. Amazing view from lounge	Yotel	TripAdvisor	Likeability	Positive



	and bedroom. Staff super cool and helpful. I'll list my favourite things: - Located in the best part of manhattan - Close to subway and times square - easy to check in and check out - Luggage lockers (super cool robot in the lobby) When I come back to the big apple Yotel will be my choice				
94	Fun hotel, good value for location. Cool robot in the lobby. Staff was courteous. Lots of things to eat nearby. Wifi was good. Little breakfast cafe was reasonable for new york but the breakfast buffet overpriced for pretty limited selection	Yotel	TripAdvisor	Likeability	Positive
95	Early check-in is available. For anything before 2pm it's at least a \$30 fee. Late checkout is also available for at least \$40. This is all depending on availability, capacity. They have bag storage, though, for \$2!!! It's also handled by a robot! There are people assisting but a robot puts your luggage in a bin! Yobot is cash only, so be prepared.	Yotel	TripAdvisor	Likeability Perceived intelligence	Positive Negative
96	It has always been my dream to visit New York City. My 21st birthday year came around and we treated ourselves to the trip. NYC will always be expensive and we	Yotel	TripAdvisor	Likeability	Negative



	knew we had to save for the trip. We decided to go for Yotel as my boyfriends sister stayed in 2017 and loved it- we also chose this place as there was no tourist tax when they went. When we got there we weren't greeted by anybody. We knew Yotel was a modern establishment which was run by 'robots'... so we had to check in by a silly tablet computer thing. In our heads we imagined being welcomed by a lovely hotel receptionist like in Home Alone, but no welcome...which made an impersonal experience. we were given our room key in which we had on a low floor with no view of the city. Kind of disappointing but we knew you had to pay for a view.				
97	Nice hôtel. Great location. Extra fee too high though. Half the price I paid for the room. Robot was cool and fun. Felt like being on a trip to the moon. No curtain between the bedroom and the bathroom. Overall quite good.	Yotel	TripAdvisor	Likeability	Positive
98	The room was so dirty. Towels, counters, and curtains had stains. Weird mildew smell. And leak from ceiling above the shower. The problem is, the hotel focuses too much on robots and vending offerings as opposed to cleanliness and room comfortability.	Yotel	TripAdvisor	Likeability	Negative



99	I really like the self check-in and check-out. It's very efficient. The location is perfect for my business and for a good rate. It was also very entertaining watching the robot arm storing luggage bags. The room is not big but arranged very nicely and didn't feel crowded. Again, very efficient.	Yotel	TripAdvisor	Likeability	Positive
100	Very poor level of service. Totally unfair sales practices. The hotel charge a 35 USD service fee per day (for what? Good question). It's written in the bottom lines but the price looks much more interesting at first glance. Totally unfair with competitors that look less competitive but are in reality more competitive. You have to pay for everything and you'll find robots everywhere. The only human I saw asked me 6 USD to store 3 luggage for no service as the robot do it for him. I never carry cash when in the US as credit cards are accepted everywhere (except here). So I had to withdraw money just for this stupid 6 USD a few hours before departure. Minimum is 20 USD at the ATM inside the hotel and you are charged 5 USD (25%!!!) for this	Yotel	TripAdvisor	Likeability	Negative
101	Beginning with the modern check in, up to the modern check out and the very helpfull robot (YOBOT) for	Yotel	TripAdvisor	Likeability	Positive



	our backage, this hotel is an now existing hotel with a future touch. The relaxing-arrea in the 4 th stage ist very nice.				
102	If you are looking for a modern hotel that has many features not found in traditional hotels, this is the place for you. Great location, cool robot luggage storage, very nice employees, adjustable bed/sofa, very clean hotel. Highly recommend, great value.	Yotel	TripAdvisor	Likeability	Positive
103	The bill amount and the amount YOTEL charged on our Credit Card do NOT match; the invoice stated that it's US\$80.32 for 2 nights, but YOTEL charged US\$100 on our Credit Card. No email reply at all for the issue. Besides the facility fee per day, you also need to expect to pay US\$1 for each cup of warm water from their machine, no water kettle available in YOTEL at all. Moreover, for better time management please use manual instead of their robotic luggage storage; by staff it took 2-3 minutes merely to take care of your luggage, by the robot on the Ground Floor it took at least 5-6 minutes for storing and retrieving your luggage. We tried both. And the main room lights are purple-ish no matter how you adjust the setting, so be prepare that the visibility wasn't as good as in the	Yotel	TripAdvisor	Perceived intelligence	Negative



	bathroom (at least there's brighter lighting near the toilet's mirror).				
104	Yotel is well located, close to Time Square (10 minutes by walk). The robot at the entry will take care of your luggage. That's really cool. The service is tiny with few people to help. The quality of service is horrible. They arranged a taxi for me to go to the airport. It came late then I missed my flight. Horrible experience.	Yotel	TripAdvisor	Likeability Likeability	Positive Negative
105	The Yotel was is a great hotel with a cool airline vibe. The robot in the lobby stores your luggage- how cool is that?	Yotel	TripAdvisor	Likeability	Positive
106	Well located, clean, lovely staff, great terrace bar, nice food/drink selection. Good price. The digital check in/out, reclining bed and robot are fun editions and made our stay easy. Would definitely recommend for budget stays within a c.10 minute walk of Times Square.	Yotel	TripAdvisor	Likeability	Positive
107	The room has beautiful views amazing shower comfortable bed for a nice deep sleep I love the antisocial of the hotel to check in with the robot check out with your phone of the and everything was so convenient in the area.	Yotel	TripAdvisor	Likeability	Positive
108	The hotel has the perfect location, it's modern, comfortable and clean. The cabins have been perfectly designed and have beautiful views too. Everything	Yotel	TripAdvisor	Likeability	Positive



	was thought to enjoy. Friendly staff all around. Even Yobot is a nice robot.				
109	is the futuristic robot to store your luggage if needed. We haven't used it but I noticed that even if the idea is innovative and fun, the process takes quite a while. Be patient. For sure kids will like it.	Yotel	TripAdvisor	Perceived intelligence Likeability	Negative Positive
110	I really loved my stay in this hotel. They have robots to help you do the check in and to take your luggage. It was the first time that I have ever seen something like that! a whole new experience. The rooms were also really clean and cozy. I will certainly go back!	Yotel	TripAdvisor	Likeability	Positive
111	I didn't need to but you can leave your luggage downstairs in the lobby using a Robot - an automated luggage storage system which looked brilliant and very entertaining to watch.	Yotel	TripAdvisor	Perceived intelligence Likeability	Positive Positive
112	The amenities at Yotel are good. We skipped the self-check in and proceeded to the 4th floor for full service. The robot luggage keeper was out of service the day we arrived. We dropped our bags with the doormen, at a cost of \$2 each. The Terrace and Fig Restaurant seemed popular. We did not spend time there. The gym although small appeared to have fantastic equipment. We were too worn out exploring the city to try it out :(	Yotel	TripAdvisor	Perceived intelligence	Negative



113	The hotel was in walking distance to Times Square. The lobby was very cool with robot luggage machine. The lobby also had no attendant check in is done on a computer by the visitor. This sounds confusing but it was very simple. The rooms were spotless and had everything you would need. The beds were adjustable and very comfortable. There are out door spaces, we were not there in warm weather so we did not use but they looked really nice.	Yotel	TripAdvisor	Likeability Perceived intelligence	Positive Positive
114	The hotel looks very cool the moment I stepped into the front door. Check-in and checkout at the front desk is through computer screens. No live persons. Easy and swift. A robot arm handles the luggage storage if you want to get the bags after 3pm. Also have live persons to help you store luggage if you want to retrieve it before 3pm.	Yotel	TripAdvisor	Likeability Perceived intelligence	Positive Negative
115	The hotel is innovative from the robot who stores your luggage to self checkin to rooms designed like a cruise ship cabin. We loved the whole setup. If you want spacious this is not the hotel for you. But if you like a new adventure this could be your place. Price was very reasonable.	Yotel	TripAdvisor	Likeability	Positive
116	The property is conveniently located between Broadway and the Javits center—the two things I	Yotel	Booking.com	Perceived intelligence	Negative



	came for. There is an economy of space to consider but I was only in my room to sleep and I was on my own without needing to jockey for space with someone else. There's a notable robot in the lobby that stores bags and it's a self service check in, but always someone around to help if needed. I liked being able to breeze in without waiting to check in.				
117	Automatic check in/out machines. Automatic luggage keeping robot. Not clean enough. Linen were not replaced, washbasin area hasn't been cleaned. Good location ! just 8 minutes away from Times Square. Breakfast was super good, so delicious! The robot is kind of cool ! Metro stations not really close. You gotta walk all the way to times square or Port Authority.	Yotel	Booking.com	Likeability	Positive
118	I give 10 out of 10 for the comfort, though the room is quite small, everything is perfectly organized. The bed is very comfortable. The design is great and 2\$ luggage service robot is amazing. The hotel double charged my credit card and still hasn't released the hold. I sent 2 emails, but had no answer. That's weird service management.	Yotel	Booking.com	Likeability	Positive
119	The location is just great. Few blocks away from Times square. Great restaurant options just around the corner. „Next level“	Yotel	Booking.com	Likeability	Positive



	stay in terms of self check in over a pc, luggage storage done by a robot, bed that you can use with an electric switch. Really nicely designed small rooms that have everything you need. However, I must admit that you could see that many things like sink, shower need a little refurbishment.				
120	Comfortable beds, shower was great, lighting was good, view was ok. Very clean, great location, good food, robot was cool. The curtain that separates the bath from the room was a little strange but okay. No ice bucket, no guide for tv, should have some kind of anti slip on the bath floor and parking was a little pricey but hey its nyc right, it was very convenient.	Yotel	Booking.com	Likeability	Positive
121	Super modern hotel in a great location, good for the price point. I was on the top floor on the end with a decent view and it was quiet! Room was very modern, bed super comfy. Loved the reclining bed, pillows, and shower was excellent! Not a whole lot of real humans around, check-in, baggage storage all via computer and robot. Bathroom is only semi-private separated from bedroom via a curtain and a glass door.	Yotel	Booking.com	Likeability	Negative
122	The bed was very comfortable and the hotel was very cool looking and	Yotel	Booking.com	Perceived safety	Negative



	had great public spaces. The gadgets were all broken when we were there. The robot luggage storage was broken. The tv in our room was broken and none of it's features would work. The bed tray was missing and there were a few old cigarette burns on the desk.				
123	All was great with my stay at the YOTEL however there was two issues that proved to be an issue. The ice machine on my floor along with the floor above and below me were out of service preventing me to grab water or ice during my stay. Finally, I wanted to leave my luggage with the robot in the lobby when going out for the day in New York City. However, when I went to use the robot it said contact a staff member. When I looked around for help no one was there so I had to walk around the streets with my luggage as I went for lunch. The stay was great however these small issues turned out to affect my stay.	Yotel	Booking.com	Perceived intelligence	Negative
124	If you are over 30 years old, skip this place. Its designed for millennials. Except for the restaurant and bar areas, there did not appear to be any staff working there. Fully robotized. There is no overhead or table lighting.	Yotel	Booking.com	Likeability	Negative
125	The location was convenient and the room was fairly clean. The rooms were extremely small and	Yotel	Booking.com	Likeability	Negative



	the beds could be compared to hospital style beds that recline using a remote. We also found the close proximity to the bathroom uncomfortable, considering the only form of separation between the two spaces is a sheer white curtain. The customer service is non-existent as everything is computer / robot operated. The feel of this hotel was very hostel/new age backpacker.				
126	Love the robot	Residence Inn Marriot	Google	Likeability	Positive
127	We enjoyed our 2 day one night stay in this modern hotel. Wally the robot is a helpful feature if you would like to get things sent to the room. Grub hub is available for food deliveries.	Residence Inn Marriot	Google	Likeability	Positive
128	Excellent everything we needed and more. Loved Wally the robot. Great breakfast everyone enjoyed the waffle maker. Very convenient service to the airport. Nice experience no stress.	Residence Inn Marriot	Google	Likeability	Positive
129	The perfect paradise! Beautiful, a friendly little robot, so easy to get around with a kiddo in a wheelchair. I can't wait to get back!	Residence Inn Marriot	Google	Likeability	Positive
130	Clean, comfortable, and spacious. Love the robot that brings towels, wash cloths, etc. to your room.	Residence Inn Marriot	Google	Likeability	Positive



131	We stopped at the Residence Inn by Marriott Los Angeles on our way to Paso Robles. It was a great hotel to grab a quick bite, sleep and then head out for our wine tasting weekend. Wally the Robot is the coolest!!	Residence Inn Marriot	Google	Likeability	Positive
132	Excellent overall, kids were very excited to use the robotic Butler.	Residence Inn Marriot	Google	Likeability	Positive
133	There is a little robot! It's so cool I liked how small it was and the way it moved around I also love the breakfast waffles.	Residence Inn Marriot	Google	Animacy	Positive
134	Great staff and facilities. They even have a robot that feeds you.	Residence Inn Marriot	Google	Likeability	Positive
135	This place is so nice! The kids were ecstatic when a robot delivered their dinner from the store downstairs. The beds were comfy and it's very modern. Little kitchen and everything. Will stay again.	Residence Inn Marriot	Google	Likeability	Positive
136	My kids loved this hotel, the free room service from Pepper the robot made our stay unforgettable.	Residence Inn Marriot	Google	Likeability	Positive
137	Seriously. After a long international flight, this is where you want to end up. Really great staff, comfortable rooms, quiet. The perfect place to recover from jetlag... And they have a cool robot that my kids loved!	Residence Inn Marriot	Google	Likeability	Positive



138	Very friendly front staff and great breakfast. They have a robot for delivery! Wow guys!	Residence Inn Marriot	Google	Likeability	Positive
139	Outstanding, friendly service, awesome room, with a view. And Wally was great.	Residence Inn Marriot	Google	Likeability	Positive
140	Great Hotel, rooms are very spacious over 500sqft very clean and cozy! Reasonable rates for a Los Angeles Hotel room. i just didn't care for being overcharged for parking i later discovered i was charged double by the hotel for what the shared parking structure daily rate is. But the best part was Wally the Butler!	Residence Inn Marriot	Google	Likeability	Positive
141	Great hotel to stay at before an early flight out of LAX. Wally the butler is fun when it brings you extra towels or pillows. Standard Continental breakfast. Professional staff and great shuttle right to the airport	Residence Inn Marriot	Google	Likeability	Positive
142	They were labeled pretty clearly. The breakfast was good and they were plenty of toasters and waffle makers so, the line went very quick. There are however minimum choices of fruits but the scramble eggs and sausage (pork and chicken) are good. One interesting thing to see at the hotel is if you need something (such as	Residence Inn Marriot	TripAdvisor	Likeability	Positive



	paper tower), they will send "Wally" to bring it to you. The robot knows they way up and get to the front of your room to delivery the item which is pretty cool. Overwall, we enjoyed the stayed and would come back again.				
143	Wonderful staff, amenities & location makes you Happy to be staying at this Marriott. Scenic views of the airport, from our room, were breathtaking. Phil is the most professional, friendly and genuine staff member who welcomed us the past 2 years. Felt like being back home. We love Wally the robot too. Keep up the Great Customer service!!	Residence Inn Marriot	TripAdvisor	Likeability	Positive
144	We weren't sure what to expect from a hotel so closely placed to the ever bustling LAX. But, this hotel exceeded all expectations. Wally the Robot lured us to the hotel. But, the wonderful check in by Front Office Manager, Shuki will be the reason we return. She was friendly & informative about the area. We were only staying for one night. But, were treated as if we were staying a whole week. Thank you Shuki.	Residence Inn Marriot	TripAdvisor	Likeability	Positive
145	We had a great 3 night stay at this airport hotel. The location was great, and the rooms were very clean and spacious. They even have a cute little robot butler that	Residence Inn Marriot	TripAdvisor	Likeability	Positive



	delivers sundry items from downstairs to your room. The only drawback is the parking situation. They share a garage with several other businesses and there is no direct access to the hotel from the garage, making it inconvenient.				
146	Spent the night prior to an early flight out. Shuttle to/from airport was punctual. All the staff were friendly and helpful. The Starbucks in the lobby uses a robot to deliver coffee to your room! The rooms were clean and modern. The amenities in the room were very nice. Do wish that there was bottled water in the room. Would stay here again.	Residence Inn Marriot	TripAdvisor	Likeability	Positive
147	We only stayed here one night so we could catch an early flight the next morning, but we loved this hotel! Our room was huge and very nice. We had an excellent view of planes flying into the airport, so the kids loved that. The kids also loved Wally the robot butler. They ordered snacks from the little market in the lobby and Wally delivered them to the room. The hotel has a Starbucks, pizza parlor, and a sub shop so we didn't have to venture out for dinner. We tried the pizza and it was delicious. We didn't get to try the free breakfast because our flight was really early. The airport shuttle was fast and	Residence Inn Marriot	TripAdvisor	Likeability	Positive



	dropped us off right at our gate. Very convenient! We would love to stay here again if we visit the LA area,				
148	My family and I love staying at the Residence Inn by the Los Angeles airport. The hotel is very comfortable and has all the amenities you could want. There is a bed for everyone, a kitchen, and lots of room. The buffet breakfasts are awesome. We love the turkey sausage and the potatoes and the juices. The staff are really nice. And we love seeing Wally. Wally is a robot who can bring you up some extra towels or a soda. We love watching him in action. The hotel is located near the airport, convention facilities, and various eateries. We always look forward to our stay.	Residence Inn Marriot	TripAdvisor	Likeability	Positive
149	My kids love this hotel, as the rooms are spacious, the breakfast is great and Wally the robot brings ice cream to your room. While it is convenient to LAX and makes making your flight a breeze, it's also central to the rest of LA, too. The staff is incredibly kind and helpful, too. Maete at the front desk was always helpful and had a huge smile every time we saw her. It was too cold to use the pool this trip, but the poolside cabanas looked inviting. Super convenient Jersey Mike's, Z Pizza and	Residence Inn Marriot	TripAdvisor	Likeability	Positive



	Starbucks. Just need a Chick-fil-A! Looking forward to coming back soon!				
150	They have a cute robot, Wally, who will deliver food items to your room - foods from the little market they have. I ordered my daughter a treat just so she could see Wally in action. It was fun! Oh, as far as parking goes, there is a parking garage in the back of the building. You'll pay \$40/day to park. But, before you go in there, get the parking added to your room key AND get a parking permit to hang from your rearview mirror. That way you can park in the really good parking spots. (We didn't know about the permit until the last 2 days we were there....sure saved a lot of walking for us!) Also, breakfast (which I mentioned before) is included. There is a pizza place and a sub shop attached to the building. They were both pretty good. The pizza was a bit pricey; but, we didn't have to drive anywhere to get it! Also, because I'm not a seasoned traveler, I spent the first 10 minutes thinking the elevators weren't working. It wasn't until someone got on and tapped their room key on the thingy above the	Residence Inn Marriot	TripAdvisor	Likeability	Positive



	floor numbers that the elevator took off! Duh.				
151	We happy with our experience there, we would come back again. Wally the robot is just a plus, kids loved it!	Residence Inn Marriot	Booking.com	Likeability	Positive
152	The room was beautiful, clean and the staff was wonderful...including the robot!!!	Residence Inn Marriot	Booking.com	Likeability	Positive
153	Seeing robot delivering items to your room was fantastic! Bed is very comfort and room is spacious! Breakfast area a bit noisy and crowded.	Residence Inn Marriot	Booking.com	Likeability	Positive
154	It's the last night in LA. We wish to stay in a hotel with kitchen. The check-in staff was nice, and provide us an early check-in for better rest. The room is big facing the airport but not noisy. It's funny watching the plane take off one by one while cooking. Wally is a robot for in-room dinning. He's cute. I will try him next time. Airport shuttle is convenience. Car parking is expensive. Sunday breakfast starts at 7:00am is a bit late for us who needed to check in airline at 6:30.	Residence Inn Marriot	Booking.com	Animacy	Positive
155	The suite is pretty good! Like home. Two beds and one sofa bed there. It is good for family travel. The room is clean. The breakfast is good. Also, you can ask the robot service. The robot is cute. The parking is not free, 30 dollars per night. The price is a little	Residence Inn Marriot	Booking.com	Animacy	Positive



	expensive, before arriving at the property, I found the price dropped!!!!!! But I cannot change the booking anymore, which made me annoyed. So, the price I payed actually can make me choose a better hotel.				
156	Finding a hotel in LA is not easy, but the proximity to the airport by shuttle is super convenient and the beaches are close by. We really liked it. On the other hand, to get to the downtown and tourist areas, you have to take an Uber (40-50 min). The staff at the hotel are very nice and helpful. There is a robot circulating in the hotel! Breakfast very complete and quite good. We could have stayed there all weeks!	Residence Inn Marriot	Booking.com	Likeability	Positive
157	We loved the room, very spacious with a kitchen and sofa. There were five of us and there was space. We called room service and a robot took our order. Friendly. There was no restaurant or bar in the hotel. Lots of people at breakfast in a relatively small area for the amount of people.	Residence Inn Marriot	Booking.com	Likeability	Positive
158	Functional hotel and good standards for the purpose of being close to the airport, well equipped kitchen and comfortable dining table. Free shuttle bus to the airport. A varied breakfast, but nothing special. We liked the robot assistant the hotel has	Residence Inn Marriot	Booking.com	Likeability	Positive



	(Wally). The sofa bed was not very comfortable.				
159	Centrally located, we decided this hotel so that we could explore LA. The shuttle stops right at the hotel and from there you can explore all the other routes in LA. The room is large and clean, modern furnishings. My kids loved Wally (the robot that brings you anything you want) it automatically goes through the hotel to the room in question. Parking was expensive and there was some aircraft noise.	Residence Inn Marriot	Booking.com	Likeability	Positive
160	It's hard because there are no people when I'm really in trouble.	Henn na Hotel Japan Nagasaki	Google	Perceived safety	Negative
161	It was the second stay. From Huis Ten Bosch, It is interesting because it is a robot reception, but sometimes it does not work, which is annoying. There is a staff button if you need real people to help. Food has vending machines. It is cash. Drinks, convenience stores, card payment only.	Henn na Hotel Japan Nagasaki	Google	Likeability Perceived intelligence	Positive Negative
162	It is good to adopt the latest technology, but there are many troubles and inconveniences. In addition, the room was a cottage type, so I had to go out of the lobby to go to the room, and I had to go to get my own rental, so it was quite troublesome.	Henn na Hotel Japan Nagasaki	Google	Perceived intelligence	Negative
163	You can experience different experiences such as robot reception, robot luggage reception,	Henn na Hotel Japan Nagasaki	Google	Likeability	Positive



	and unmanned convenience store. I think it's fun to stay at such a hotel in an occasional theme park. The price is very reasonable and early park inn is also possible. The room itself is simple and there is a bath in the back of the toilet. There is a boiling pot, but if you buy coffee and tea at extra cost and do not enter, you will not leave it in the room itself. There is no need to keep in mind, as there are no fabrics.				
164	The fact that the number of staff members can be reduced by robotization has been a topic for some time now. I stayed for the first time, but honestly I expected something more smooth. I think that the robot and the operation feeling at the time of check-in, and the concierge by the tablet and AI in the room can further improve in terms of UI and usability. There is not a lot of dissatisfaction in the room itself, so if you want to go for the robots, you should find something else.	Henn na Hotel Japan Nagasaki	Google	Perceived intelligence Likeability	Negative Negative
165	The reception robots were hard to understand, but it was interesting. The store was also an unmanned system, but there weren't many products and it was awkward to get in and out. It is best to buy food and drinks in advance. Although the room was small by word-of-mouth communication,	Henn na Hotel Japan Nagasaki	Google	Perceived intelligence Likeability Perceived safety	Negative Positive Negative



	our room was very new even if two children were very new. Above all, it is attractive that the toilet bath is different. It is minus that the door of the room is inward.				
166	It was somewhat uncomfortable to check in with a robot that looks like a human. This time I booked two rooms at a travel agency, but when I entered my name as a representative, the second room was no good, and I asked the staff to come to me. As it is the first time, it was a little hard to understand. The room was clean normally. However, I had two children, so I was happy if it was a little wider. I was looking at the area in advance, but I felt small when I actually stayed, so I would like to make it a bigger room if I use it next time. The breakfast buffet was delicious.	Henn na Hotel Japan Nagasaki	Google	Anthropomorphism	Negative
167	Was interesting! There are various robots, but the dinosaur particularly was cute! They should make more robots look like animals! Check-in is also fun.	Henn na Hotel Japan Nagasaki	Google	Animacy Likeability	Positive Positive
168	It feels like I jumped from the rarity in July 2016. I enjoyed the robot, but I would not repeat it. I feel somewhat lonely. As labor cost reductions and a declining birthrate occur, will it be a world where it can not be helped? AI is useful, I liked the way it moved, it	Henn na Hotel Japan Nagasaki	Google	Likeability Animacy	Positive Negative



	was realistic. but it's also a good idea to reduce your body movement. It is good if it does not become horrible.				
169	Interesting, a hotel where only robots work.	Henn na Hotel Japan Nagasaki	Google	Likeability	Positive
170	My child was surprised by the dinosaur robot at the reception, he was scared to communicate with it	Henn na Hotel Japan Nagasaki	Google	Animacy	Negative
171	The robot service staff is very interesting, but the Check-in process and method will be somewhat unsuitable for foreigners. Of course, you can call the human service personnel to assist. The baggage can be sent to the room with the assistance of the robot. The room can also be used in English or It is a Japanese control device. In addition, the restaurant of the hotel is also a very healthy concept, using the ideas of organic fruits and vegetables and therapeutics to operate.	Henn na Hotel Japan Nagasaki	Google	Likeability Perceived intelligence	Positive negative
172	It may be very good for people who are not good at dealing with people, but I like people. Everything is done with robots, vending machines and smart convenience stores.	Henn na Hotel Japan Nagasaki	Google	Likeability	Negative
173	I used the robot at the entrance, it was a the dinosaur, which my child found interesting. Not getting used to check-in with robots, I was indebted to people. There were about 2 to 4 rooms in the room,	Henn na Hotel Japan Nagasaki	Google	Animacy Likeability	Negative Negative



	and the inside was clean. Electricity and air conditioning talk to Tully, but it is not easy to answer. Future improvements will be necessary. My child was scared of Thrillertown in Huis Ten Bosch, so I do not know if I can go to Huis Ten Bosch in the future. I'm sorry.				
174	Figure that hotel accommodation is more about quality service and human touch. The feeling of security is important and therefore, it's creating a bit of insecurity when guest is surrounded by gadgets that suddenly talk to you ... which may or may not have camera - evolution of technology Vs human adaptation.	Henn na Hotel Japan Nagasaki	Google	Perceived safety	Negative
175	Half interest, I tried to stay in the exciting half. The correspondence of the staff was wonderful. It may be hard for people who are not used to it, but I like it.	Henn na Hotel Japan Nagasaki	Google	Likeability	Positive
176	The first thing you see in the lobby is these robotics hosts that help you check in. They do speak Mandarin, English and Japanese, but they are rather limited in functions. They scan your passport and then give you your room key, essentially a reskined kiosk that you would see in an airport. And before you get into your room, there is an option to scan your face to use the facial recognition instead of the room key. It uses a	Henn na Hotel Japan Nagasaki	Google	Perceived intelligence Perceived safety Anthropomorphism	Negative Negative Negative



	2D scanning process, and unlike the face id on the iPhone X, it can be theological deceived by a photo. Although to be completely fair, it is unlikely to be served by robots. The security aspect are still left to be desired. There is this robot room assistant, and it is got to be one of the creepiest things I have ever seen. I mean just look at it! The voice recognition is inaccurate and it reminded me of siri in beta phrase if even that. Given the fact that most things around us these days are hackable, this thing offers no value other than having an extra set of microphone that listens to you at all time.				
177	I recommend it if you go to Huis Ten Bosch. It might be disappointing if you expect everything to be the latest cutting-edge robot hotel. I think if you have children, I think that I can enjoy it a little, but I am not so rich in amusement, so I can stay cheaper than other nearest hotels. If I did not want to stay once, I might not recommend it there.	Henn na Hotel Japan Nagasaki	Google	Perceived intelligence Likeability	Negative Negative
178	It is not enough for robots only. Even if you do not understand something, you can not solve without calling the staff. Robots can't talk! It is only a facility that can only stay overnight.	Henn na Hotel Japan Nagasaki	Google	Perceived intelligence	Negative



179	We love the robot theme and the fun ways the hotel employs them. Kids seem to love the miniature walking robots in the orchestra and the check-in dinosaur. The rooms were more spacious than expected and the included breakfast was much better than expected for a hotel meal. Overall solid entertaining options for lodging in Sasebo!	Henn na Hotel Japan Nagasaki	TripAdvisor	Likeability Animacy	Positive Positive
180	I was expecting this is sort of a high tech hotel because it uses robot to serve you. However, I was so frustrated when we did the check in. We scanned our passport so many times and still didn't work. It took us so long before we can successfully check in. They provided handy phone in the room. However, we tried to call front desk and it didn't work. So we have to walk all the way to the front desk and they still couldn't solve the problem. I think it's over priced given their robot didn't work well. I think Siri is much smarter. May be Japanese might work. I don't know!	Henn na Hotel Japan Nagasaki	TripAdvisor	Likeability Perceived intelligence	Negative Negative
181	Stayed here for a night to visit the theme park. Check in was interesting with the robots, however not practical as I had to repeat the check in process multiple times as the robot did not understand me. Finally managed to get the room checked in after	Henn na Hotel Japan Nagasaki	TripAdvisor	Perceived intelligence	Negative



	about 15minutes. Stayed in a Twin Room, spacious and comfortable. The hotel is a 10minute walk from the theme park entrance.				
182	I could sleep comfortably in a spacious bed. I enjoyed being welcomed by the dinosaur robot and it entertained my grandchildren. The people supporting the reception robots were kind. Thank you very much.	Henn na Hotel Japan Nagasaki	Booking.com	Anthropomorphism	Positive
183	It was nice to see the lighting of Lagunasia perfectly. The room, bath and bed were big, the breakfast was good and the dinosaurs were fun. I advise it.	Henn na Hotel Japan Nagasaki	Booking.com	Likeability	Positive
184	There was a dinosaur at the reception that the children really liked. The corn soup was outstanding.	Henn na Hotel Japan Nagasaki	Booking.com	Animacy: positive	Positive
185	The hotel rooms are very clean and the dinosaurs at the lobby are very lifelike, which was cool. The adults and the children really liked it.	Henn na Hotel Japan Nagasaki	Booking.com	Animacy Likeability	Positive Positive
186	Too automated, it's a bit tricky to check, but the human worker was very nice and helped to complete the process. Also, don't make the robot look like a human.	Henn na Hotel Japan Nagasaki	Booking.com	Perceived safety Anthropomorphism	Negative Negative
187	Supper! And the breakfast was delicious, the dinosaur reception was interesting. The grandchildren were surprised, scared and shy at first.	Henn na Hotel Japan Nagasaki	Booking.com	Likeability Animacy	Positive Negative



188	The food was delicious. The room was clean and it was nice to see the lightning from the window at night. The dinosaurs were welcoming, and the kids were happy to stay at this strange hotel.	Henn na Hotel Japan Nagasaki	Booking.com	Likeability	Positive
189	It was generally beautiful. I was interested in the robot at the reception, so glad I got this experience. But I would not go another time.	Henn na Hotel Japan Nagasaki	Booking.com	Likeability	Positive
190	We loved the dinosaurs at the reception!	Henn na Hotel Japan Nagasaki	Booking.com	Animacy	Positive

Appendix 4: Transcribed Expert Interviews

Appendix 4.1

Interviewee 1: Co-founder and Director of growth at WELBO. He helps customers with high-quality robotics software that improves business processes.

MN: Researcher

E1: Roeland

MN: Thank you for making the time to do this interview. Do you mind if I record it?

E1: no I do not. How long is this going take you think?

MN: it should not be longer than half an hour.

E1: okay

MN: First of all, I'm very interested in your background so, how did you get into the social robot industry in the first place?

E1: I always loved robots. I think when I was 12 I am 39 Now I watched Star Wars with my dad and it was very amazed by all those robots, science fiction. And about five years ago, I decided to start, Welbo together with my co founder and the main reason for that was that I had interviewed a number of heads of companies that were dealing with robotics, and I found that most of them had a technical background and they don't have a commercial background so or any international business background, and I found that actually that brought some value, because a lot of them were struggling with how do we bring this technology to the market. And so I think go to market strategy something we can do.

That's what we started with, and also the other thought I had was, well I always thought it was a fairy tale, science fiction fairy tale, like Star wars. It's a nice thought but it's in the future. And five years ago I did a lot of research and I found hey there's lots of robots actually already on the market are coming to market very soon. So it's no longer science fiction, it's here. So that's when we start.

MN: Nice, nice. Yeah. Okay, and how did you experience the service yourself when you first encountered a service robots?

E1: The first time I interacted service robots was maybe during my trip in Japan. No, I think, I think, I think it was this one (shows robot) My co founder built this one. And it was a reception robot, and I had seen, I had studied, I mean I will for the purpose of this article that I wrote with KPMG I have talked to a number of companies that I'd never actually seen it in a video but never experienced it myself, but when, when I went to Noordwijk, this robot actually welcomed me in combination with a screen, and this robot picked me up and rolled me to the meeting. I was really impressed I was really impressed because everything I've been reading about was apparently already there in the Netherlands. It's was a relatively small IT company, so I was pretty blown away. I think the quote, I don't remember who said it or something about the future is already here but it's not evenly distributed. It's like what you said earlier about will robots be in hospitality. Yeah, there are here already, there are already robots in the hospitality, it's just not evenly distributed, they are concentrated in hot, hot spots, especially in Asia but of course in the end, it will be the future is already here, it's just not evenly distributed.

MN: When introducing robots into a company, what is the main reason for companies to introduce social robots into their teams?

E1: yeah, this question why would companies use social robots. I think one of the prime drivers for most of our customers is to show that they are innovative.

We work with a lot of companies that are old companies that struggle to attract talent, and also spend millions on all sorts of innovative projects that are not physical because they're in the back end. This is a very visible way to show how we take innovation seriously. And yeah, we want to we want to showcase that we, that we are investing in new technology.

But the secondary reason of course is has to do something useful. And from the very start we said great. Sure, people might buy us initially because they want to be cool, but it cannot be a one trick pony or it cannot just be a gimmick value it has to be something useful. So I think we're approaching a point where we are definitely doing something useful for most of the customers,

MN: What do you mean exactly with useful?

E1: Useful in the sense that you're executing a task that is part of the primary process of for example, receiving guests, or making sure that the person that is there to pick up their guests gets an alert or to gather feedback, or but there is, I mean if you would say it's just there to entertain, and it's like a piece of art, which is nice, but not very useful. But if it's also part of the process of a business process that has to happen, then it's useful.

MN: To what extent do service robots improve productivity and how. So do they actually improve productivity, and how would they?

E1: I think the role of social robots can take over part of the tasks that a person has. So in that sense it can improve productivity. It can also make it more efficient by allowing me to be at multiple locations at once that telepresence aspects we just talked about. It can be in addition to the team, and, yeah, make sure you can process X plus one widgets per hour. So in essence, can be a productivity improvements.

I think can also be a not so much productivity but it can be an experiential improvement so you can add certain elements of service, which was not there without the robot, because the robots can do things that people cannot like repeat the same thing over and over with a smile, gather feedback in a very objective manner like structural things that we build in.

But I do want to say that that is over time right so it's initially the robot might actually decrease productivity. Like with any innovation, you start with any change you make, you will dip in productivity, first of all there's a learning effect before you increase the productivity.

MN: Is that something you see within companies that you introduce pepper to or any other robots?

E1: I think so because we have to change the process. We have to make sure that they send people to the to the robot for example.

MN: okay and eventually you do see like a learning curve that the productivity rises?

E1: Yeah, for sure. And when it goes to labor, we measure wages process so people process per hour and stuff. Contrast that with the default like human team yeah so we see the productivity of the robot and we know if it's functioning well within team.

E1: We also have locations where we only have the robot. Works like a charm.

MN: Oh really?

E1: Oh, yeah, Because there are success stories of our locations where a human team really feels the robot role of added value and actively sending people to the robot, or where the robot does stand alone because said it's very clear, there's a humanoid that looks like us, that's approaching you again, then you have to interact with the robot, you have no other choice. The situation where it becomes problematic is where there's like a little bit of competition between the human how the humans and the robot where they feel like who am I, am I going to help the person or is the robot going to yeah obviously, then the human will win.

MN: So you should have either or so or just the robots, so that you know that you directly have to approach your robot, or just humans?

E1: Maybe it's the idea of as a human, I'm the VIP treatment. So I'm the exception manager in the sense that the standard process is a robot, and I will guide people to the robot, so the robot will help them. And then, I'm here for the VIP treatment in case I clearly see somebody needs extra attention, because they're sweating or nervous or they thirsty or they're they're clearly in need of some of them in an accident, or after the role has completed, and the robot is here, sort of a metaphor for all technology after the process with technology is completed, I will still give some human attention, because it is needed, but I'm the exception manager. That would be the, in my view, the best way for for hospitality people to regard their job. Now, if your idea is for the technology is the exception manager then becomes problematic.

MN: Yeah, yeah, I agree.

E1: the guests should give the robots more time for your high value interactions, let's say there's a returning customer that comes to your hotel. Every three weeks, and he is chatty and likes to talk to people. Now we know before you had to help other people. And you couldn't continue your chat with your high valued customer because you have to help other guests. Now because the robot is there, you can continue your conversation with your high value customer that comes into your place every three weeks and spends a lot of money in your hotel. Because of the robot you have more time to spend on those interactions that actually are of high value to the guest.

MN: Yeah, exactly. That's a really good value point actually. What are the most common, positive or negative client perceptions towards service robots that you know of,

E1: after having used them?

MN: Yeah, after having the interaction with the robots for example.

E1: I think what we get a lot from decision makers is that they feel like robots level up their organization, because people can see that technology is fun. It's not a threat, but it's an addition it's complimentary. And I think people are also really surprised what is possible, what are things that a robot can do like, take your voice and transcribe it into text and then you can download the text for further analysis and lots of tools in the dashboard. People are always amazed at the new innovations that we deliver. So I think their speed of innovation is also an important part. And there's negatives. Yeah, I think some people are afraid of it. Right. I think it's a minority, but I think some people are. And I think they are in general, afraid of a lot of things but definitely also of robots. And people think they are not intelligent enough because it's not implemented well, but it's part of the process around it. And, and, but we also sometimes get is. Oh, but it's really stupid. It's not as smart as I thought it was. And then we asked what do you mean? well I wanted to have a little conversation, couldn't do it. So then your expectation level of

the technology is way higher than with technology sense, that is also the main prominent because people expect a lot from humanoid service robots

MN: Okay, clear. So Pepper is seen as a humanoid robot, And to what extent do you think a humanoid robot appearance is preferred by the customers in frontline services?

E1: What I have noticed is that people don't like robots that look too much like a human. The Pepper robot is very well liked because it is small, has eyes and has a realistic voice and movements. When a robot looks too much like a human you get the uncanny valley. If people think the robot is small and cute, like they do with Pepper and Temi, I see that people really like that.

MN: Okay, interesting! so next question is to enhance human robot interaction there should be a balance between the appearance of the robot, and the way they behave. So in your experience, what do you think the right balance is?

E1: You mean that the movements are congruous with what it says?

MN: exactly like for example when I was talking to Pepper he had head and arm movements and he behaved in a certain way and he looks a certain way. What do you think is the right mixture for robots to be more appealing to customers?

E1: I think the fact that robots can move around through the space is very important, because it makes it more lifelike, but it also creates an aura of intelligence. So when something is moving around in the room you like this thing, smart. Yeah, of course it isn't, but it feels smarter.

MN: Yeah, I agree! And to what extent is it important for service robot to appear lifelike instead of machine like?

E1: I think it can be both lifelike and machine. I think those can be the same. But I think it's important because it creates an experience, but it depends. So it depends if you if your goal is to get people from A to B, as quickly as possible, and I think it shouldn't be too lifelike, but if for example, it's about the experience and maybe it's nice, the robot takes a little bit of a detour and as a little bit of a human gait. And then it moves in the meandering way. So it depends on the task the robot has.

MN: And to what extent is a service robot liked by your clients?

E1: Pretty much, yeah very much yeah scores of Softbank Robotica are like 4.7 4.8 out of five. Yeah, really high.

MN: And how do social robots recognize user emotions, and can they?

E1: So yeah, it's a challenge and I think there are lots of things we can do to make the robot more empathic like we can say oh you're wearing a nice purple sweater or I really like your hats or like your glasses. We use the name, so we make it more personalized in that way. There are lots of things that we can do to make the interaction more interesting. Without foray into assumptions about your inner world, which are probably wrong.

MN: And, yeah, interactive robots face a challenge of being intelligence. And I was wondering what your view is on this.

E1: Well, I think this is actually an area where we will see massive improvements or in the short term. So, we now say we have the Google Home, at the moment so if you ask a question like, what was the name of Obama's dog is. And it would say I don't know a

lot about that or let's talk about something else. But that is knowledge that we can very quickly add in could become like smart speaker. But of course, those are all pretty dumb things in terms of scripted information, but there are some really interesting algorithms coming out now, which can effectively freewheel and create stories and if you give them a couple of words they can build stories and you could have great conversations with software like that. So, this is coming very near term. In the coming years.

E1: I think more rather than question is, would you want the robot character. And I think the answer there is definitely yes. And I think you can we can come to a point of talk with empathy that we can very quickly tease out is this person looking for efficiency or this is this person open to character, and what type of character can I use, of course, the benefit of the robot is that they can easily switch between characters, based on machine learning if we see how this person this age from this country from this city, man or woman, maybe they will probably be probably prefer this character okay we assume this character, and that is something that is of course a little bit further away, but I definitely see that. And if you look at Jarvis, Iron Man, for example, Jarvis is a character in Ireland, they give him in the, for the first couple of movies just the smart speaker right before he becomes an Android. But then, he's already. He has a lot of character. He's like a butler, yeah basically right yeah all classical English Butler, in a computer voice. So that's a type of character that some people might like.

MN: yeah, yeah, I think so too. Definitely. And do you think pepper acquires and applies the knowledge and skills that is needed in service environments?

E1: I think so. I think they already have the skills required.

MN: Yeah. Um, okay, so I had a few more questions but can I ask two more questions? So do people question their safety or privacy when interacting with service robots?

E1: I don't know, it might be an, it's not a spouse, so people don't say it might be the reason that some people hesitate, but I've never heard it, I never experienced it in real life. And to be fair, there are 12345 devices in this room which are powered which have cameras and microphones. Yeah, nobody ever mentions that or is afraid for their safety. So, now because it's a robot now becomes a hot topic, but is never was.

MN: so nobody minds if their data or what they're telling to the robots can be stored in data?

E1: I don't think so. Of course there are concerns around privacy that we need to take seriously I'm not saying it's not being cavalier about it. But if you look at the people actually using the service, I've never had anyone struggling with this.

MN: Okay good, that's good to know. Okay so the last question is, if you would have to name three suggestions that could be done to enhance customer perception in human robot interactions, what would it be?

E1: Make sure the robot colleagues are fully onboard with the implementation of the robot. And concretely you make sure they actively send people towards the robot to try and test the robot. Make sure the robot does something useful. It's part of the business process, not that it's just an entertainment only, although that's part of it as well. And make sure that the robot is managed well, so that you have a team working on making sure that the robot keeps being improved, and that ideally the customers also part of the team and suppliers, such as ours is also part of the team making sure that the implementation keeps improving over time. So don't create as a product that you put somewhere between, treat it was an employee because you want an employee to develop as well.



MN: Okay. I saw on your website that, that you think that the experience is best when people and social robots work together. Yeah. And why is that exactly or why do you think that is?

E1: I think it gives the user the guests, the optimal experience because you have both interaction with the person and you have interaction with the experience that was built for them with the robots, but also I think there's an interaction in the sense that the if you're doing well. You are automating some parts of the human task, that means you're leveling up the human. The human now has more time for high value interactions. So, it should make the overall experience better.

MN: Yeah, yeah. Good to know. Okay. Those were the questions. Thank you so much for your participation!

E1: I hope it was helpful and I am looking forward to the results.

Appendix 4.2

Interviewee 2: Customer success manager at WELBO. She is an expert and researcher in human-robot interaction.

MN: Researcher

E2: Dominique Roos

MN: Do you mind if I record this interview?

E2: No not at all

MN: okay! First of all, I'm very interested in your background so, how did you get into the social robot industry in the first place?

E2: Um, I think I've always been excited about technology as well but I wasn't really specialized in this before so I did my Bachelor of commercial economics and that has led to I started with a job in the film industry so I did other marketing promotion for the film industry. And from there I moved on to something totally different, different juices for big brands, but I also had to promote those huge shots from coconut water and then a second let's do something new, so I got into virtual reality. So I got in touch with these guys from virtual reality they had a really nice booth. I'm like whoa this is so cool technology level for minimal another follow up, I want to switch to something totally different. I don't want to be in the event industry anymore or accused industry. So I decided to start my master, communications science at university, University so this was the first time that I met the Pepper robot And I think from that moment there was like wow, so I got in touch with Roeland from Welbo to learn more about the robot, I got to touch my teacher and a professor asked me him like what can I do, how can I learn more about the robots, can I maybe writht my thesis about it? And he gave me the chance to move to Hong Kong for a few months, so there I contacted with research about human robotl interaction. So I worked for this company Sophia robotics.

MN: You did research on the SOFIA robots?

E2: yeah I could do some experiments where I prepared for three different scenarios with two robots, one humanoid robots like sophia. We had another robot I don't remember the name is, but what was it was more machine like. And then the other virtual robots that you could see on screen.

MN: So really about the looks of the robots?

E2: yeah it was really about the looks of the robot.

For me that was the eye contact was very important. It can be awkward when people look directly into your eyes or not look at all. And we assumed this robot should be able to look at you.

MN: really cool! And what did you find within your research?

E2: Yeah, one of the most important things, I think, performance. So, yeah, we have really high expectation of human like robots and lower expectation with more machine like robots, and due to that you also saw that people are more disappointed, because this robot isn't doing his job very well. Well, the machine like robots do the exact same performance exception test was that the robots doing great job.

MN: oh interesting! Have you read about the uncanny valley theory?

E2: yeah, that Yeah, exactly. I applied that in my report as well.



Mn: nice! So you have actually experienced service robots yourself, and now you are researching and selling it right?

E2: yes!

MN: Okay, and how did you experience the service yourself when you first encountered a service robots?

E2: I was so happy, the first time for me was a university and the thing was coming over off college, they show me the robot and I've been through it wasn't doing that much in the beginning, But I was super excited, I was like this is so impressive, like now I know that the robots can do way more than that. Well, I had a really good first impression.

MN: Good. And when introducing robots into a company, what is the main reason for companies to introduce social robots into their teams?

E2: Okay, I think because robots gives you something in return. So if you check in for an appointment, the robot can help. And other people working can focus on other tasks

MN: To what extent do service robots improve productivity and how. So do they actually improve productivity, and how would they?

E2: Yeah because I think in the beginning, like also employees are not familiar with robots yet, but I think also, like most people now are not familiar with robots yet. So for example, if you go to Asia, like, people know what they can do with the robot and will immediately want to rush to the robot to say hey can you help me check. If a Dutch person enters a building, they have no clue that you can check in with robots. So I think there the reception team has to help people to go to the robot and get familiarized with robots. You have to guide people to go to the robot because they won't go to it directly themselves. I mean if you enter this building, it's really maybe feels weird to directly go to the robot instead of the receptionist. So, that does not mean you have to train the robot, but the guests need to get familiarized with the robot. Of course, you enter the building, and, by nature, they will directly go to the reception and reception will have to tell you can also check in with the robots. I think in a few years people will get used to the idea that you could check in with robots and then probably their behavior will change they'll directly oppose you, like okay I know that I can check in with robots because I've experienced this before.

MN: Yeah, interesting that you say this I had the same experience when walking in here I saw the robots but I walked up to the human receptionist. But it's interesting because do you think that when you enter or when you have robots in your company that it's necessary that a human, always has to be present with the robots?

E2: yeah beginning, for all those people who aren't familiar with these kind of technologies. And I think this will definitely be changed over the years. because I think, take for example again Asia there it's not necessary for any human being to be present, because they know okay I can check in with the robot, they know what to do with it and on the other side I think if you put only a robot there and no humans at all, there is no other choice than to talk to the robot.

E2: I think you have like two kind of reception at the reception team; Or have no robots, or have a reception team that embraces the technology. And I think it's also relative because I think if Yeah, we'll have more people experience human robot interaction than if they come somewhere else and you see robots next time they don't need your assistance, you know, they already know what to do. So it's just for a period, and after a few years people are used to it and don't need human assistance anymore.

MN: And in your opinion, what are the most common positive or negative client perceptions towards service robots?

E2: Now for me, the robot made me so many feel so happy. Every time I see the robot I'm laughing. Yeah, so, just seeing the robots move and talking to me is an experience itself.

E2: People think the robots are not working, but that is due to a lack of knowledge.

E2: but they're also comparing it to Alexa or Google Home and answer my questions. But Pepper is not doing that because it is not the job of the robot, the job of the robot is to check people in, gathering feedback and giving you information about the building and the weather for example.

MN: okay, clear thank you. So Pepper is seen as a humanoid robot, And to what extent do you think a humanoid robot appearance is preferred by the customers in frontline services?

E2: It shouldn't be too human like and it shouldn't be too big. If you have like a really large robot in front of you, I think that scares a lot of people and I think also again that's different in Asia because people are already used to Robots, but I think pepper. I mean, it does need eyes to look at you and a little mouth that is moving but it should be too human like as you get the uncanny valley and you will be like oh I expected more. I think Pepper is the maximum that it should be.

MN: Yeah, I think I agree because if you look at the service robots that Asia has, for example, that really looked like a human. I saw an interview with somebody once that they were talking to the robot but they saw that the mouth was moving weirdly not as people should. So he asked to the robots, why is your mouth moving weirdly, and then the robot replied, Oh, that's my secrets, or at least something like.

E2: I think it should have lifelike features so it triggers you to talk to the robot, like the eyes and mouth. People find the Pepper robot really cute and sweet and that's enough for people to make them want to approach the robot.

MN: Okay, interesting! so next question is to enhance human robot interaction there should be a balance between the appearance of the robot, and the way they behave. In your experience, what do you think the right balance is?

E2: The robot should be facing you, like Pepper it can follow your movements. And it should have proper head movement, so the user really feels like he/she is in a conversation. I don't think the arms are really necessary. I think it's nice beneficial for entertainments.

MN: Yeah, I agree! And to enhance HRI to what extent is it important for service robots to appear lifelike and the way they demonstrate physical behaviour?

E2: It shouldn't make guests uncomfortable. What I see from our clients is that they prefer a small robot. But it should have eyes and proper movement. I have been working with robots that look a lot like a human, and what I have noticed is that people find it scary or are uncomfortable to talk to it.

MN: Yes I have read a lot about that! And To what extent is the service robot liked by your clients?



E2: They really think it is an additional experience. But I also noticed that people expect too much and still rely on a human receptionist for example if they really want to have a meaningful conversation. For now, the robot is a fun addition, but in the future, due to AI it will be able to make conversation, but I don't know how people would like it then.

MN: And how do social robots recognize user emotions, and can they, I'm not sure if the pepper robots can recognize emotions but like can they?

E2: I think its a tough question, I mean the robots can recognize emotions, but the thing is, users can smile and say that they are happy but at the same time feel like really shit on the inside, and the robot cannot see that, it only sees a smile on your face. And I think that is the tricky part with emotional recognition. So, yeah, I'm not a big fan of it.

MN: I get that. Also, interactive robots face a challenge of being intelligent, what is your view on this?

E2: I don't think the robot is for now needed to be super intelligence as the task of the robot is to check people in or guide the way and not have hour long conversations. When people want intelligent conversation with the robot, they are just testing to see how far their communication can go, but its not necessary for the task they carry out.

MN: Ah okay, interesting. Do you think Pepper acquires and applies the knowledge needed in various service environments and how so?

E2: Yeah, because we're already doing it, but I think it always can be improved. Yeah, but that's the thing of technology, technology keeps improving.

MN: And do you think people question their safety or privacy when interacting with service robots?

E2: I've never experienced for example here at the reception that people are entering and are moving away from the robot because they think its scary. and, yeah, they're not afraid for, for their privacy or that the robot acquires knowledge that they shouldn't. yeah no, I never had a customer that was afraid for these kind of things.

MN: Okay, good to hear. Okay so the last question is, if you would have to name three suggestions that could be done to enhance customer perception in human robot interactions, what would it be?

E2: Phoe.. I think it is necessary that people allow the service robot to learn within their environment, that way the robot will enhance more conversation. Secondly, I think people need to change their expectations because they think robots can do way more. The thing is that AI is still developing, and so are service robots. And lastly, businesses can improve when they automate some tasks. Employees can do way more than the simple and repetitive tasks that they do now. Robots can do that for them. This way people can enhance their knowledge and robots can too!

MN: That is very helpful. Thank you for all your answers! This was all for now.

E2: your welcome! I am looking forward to the result, you will sent them right?

MN: yes of course!

Appendix 4.3

Interviewee 3: Human-robot interaction researcher and robot developer. He is making social robots even more social

MN: Researcher

E3: Stan

MN: Is that okay if I record this interview.

E3: Yes, of course, don't worry.

MN: Okay, thank you. So first of all, I'm very interested in your background, how did you get into the social robot industry.

E3: Well, I have been a robotic nerd, ever since I can remember, I really liked the technological aspect of it so I decided to go more into depth on human robot interaction because that is very new, and it's very experimental, and that's what I really like to do. So I did several research on human robot interaction. And now I'm working for a company to develop robotics to be even more social. So it's really new and experimental and I really like that aspect about my work as it has not really been done before.

MN: okay thank you and have you actually experienced this the service from robots yourself, or are you just researching it.

E3: Yes, of course I have experienced it myself. I have experienced it while I was in Asia to do, to do research, and yeah I found out that in Asia, you have really cool robots that are very new and experimental as well. They have robots that really look like humans and they have robots that look like machine like. So I really wanted to see the difference for myself, and it was a really cool experience. I never thought that robots could do so much. And for my research I went to the HANA hotel. You probably heard of it. And I wanted to experience the service myself and what I was missing, and all those kinds of things. So, yeah, that was really interesting.

MN: Oh wow, can you tell me a bit about your experience.

E3: Yes, So I went to the HANA hotel, and I found out that it was all really cool it really exceeded my expectations. However, the robots, really do all the work there. So, at night, I wanted to have the whole experience so I stayed at dinner, and there was nobody there to get my dinner and it felt kind of lonely, to be honest so yeah I really liked the robotic aspect of it, but I do think humans are still needed for the human touch because people can feel lonely if there's only robotics, but then I was I was, of course exceptional because it's almost fully run by robots. So I think you always need robots and humans to have a good experience in a hotel.

MN: Yeah, I do agree. Thank you very interesting. And when introducing robots into a company. What is the main reasons for company to introduce social robots into their team?

E3: Well, most people want robots into their teams of course to have the extra service to have to have that extra experience. But of course, the reason why hotels or other companies, introduce robots into their team just mostly to reduce costs, or increase productivity as the robots can take away several tasks that a human has. So a human can focus on other tasks while the robots do the simple and repetitive test. So it's mostly for cost reduction and reduction and productivity.

MN: Okay, thank you. And to what extent do service robots improved productivity, and how?

E3: Yeah, well that's what I just mentioned, they can take away the easy tasks from the humans, and humans can focus on other things while the robots do the simple task for them. And in the long run. When introducing service robots into the company, you have, indeed, cost reduction.

E3: So yeah, it's more, more or less to improve efficiency, as I said, because it can reduce labor costs, and it can also reduce waiting times.

MN: Okay, thank you, and what are the most common positive and negative client perception towards service robots?

E3: the positive part is that service robots provide an exceptional guest experience. So the guests really think that a robot is fun and they want to try it out for themselves because it's not yet very much known in services. So they really like working with social robots, or they like the exceptional parts of it, because it's in that it's an extra experience. So that's what guests really like, and what I would say is the negative points is that guests expect a lot from service robots. They try to talk to it, and it's not yet smart enough to really have meaningful conversations. however guests do think that robots can have good conversations but that's not yet the case because AI needs to develop and that needs to be done in robots as well. And as I said before, even though it is an extra experience. Some people might find it, impersonal, as well because, take the hospitality industry, for example, they are adapting robots at a quick pace, but as it may be an extra service. Some people find it impersonal as well.

MN: Okay that's interesting. And, well, the pepper robots for example is seen as a human humanoid robots, and to what extent do you think a humanoid appearance is preferred by the customer.

E3: Yeah, so I've been doing a lot of research on that myself, and it's quite interesting to see because a humanoid robot for example, if they really look like a human, you get the uncanny valley, you probably heard of that within your research.

MN: Yes, yes I have. I've read a lot about it.

E3: And yeah, so people have really high expectations when it comes to robots that look like humans. However, people can relate to a humanoid robot, a lot more than a robot that looks a little bit machine like so. Yeah, it's a really open field of research, for now, but yeah. What I do know with the pepper robots for example people think it's cute, it's small, it's is it has eyes, it has movements, and yeah. So people do really like that. So I think the pepper robots is a good example of a humanoid robots that guests really like. I noticed that guests approach, a pepper robots faster than a robot that really looks like a human because it rather scares them, and the pepper robot is cute, and people want to talk to it so I would say that the pepper robot is a good example of a humanoid robot.

MN: Okay, Thank you. And when you say that people want to talk to the robots, because it's cute and small. There has to be a balance between the appearance of the robots, and the way that they behave. In your experience, what do you do you think the right balances.

E3: Well as I said the appearance should be liked by the customer, and I've researched that the customer is more willing to talk to a pepper robots than a human or robot that you see in Asia, for example, And the way they behave. They should demonstrate some kind of physical behavior, the type of robot for example doesn't have any arms. But if you want to have it in a frontline service to carry luggage for example, then it is needed



to have arms, but people like it when a robot approaches them instead of the people approaching their robots. So the robot should notice when somebody is coming into the service so that the robot can approach the human. also I think it's really important for the robot to have eyes, not human like eyes because that will be scary, but I said, they do look at the human well in a conversation because that is really important. So it should have eyes. Also it should be able to face the customer directly when a customer talks to them. And it should have some kind of head movements as well so it cannot, or, or say no when a customer is talking to, to the robots so that the customer knows that he's actually listening. So yeah, I think those are really important parts that a robot should have. Yeah.

MN: Okay, and I had another question but I think you'll already kind of answered it with my previous question. Because, to what extent is it important for service robots to appear lifelike and the way they demonstrate physical behavior.

E3: Yeah well that's actually what I what I just said. So I think I've answered that question for you already.

MN: Yes, yes you did, and what to what extent is the service robots liked by our clients.

E3: Well like I said, I have had several experiences with robots, and the way that clients wants them to look like or wants to be approached by a robot that look a certain way. But overall, people are pretty happy about service robots, They think it's a fun addition to, to their team, for example. But, but yeah that's more likely the employees that think that it's a really fun addition to the team, and guests for example, like it at first, and afterwards they still rely on the humans, for example, that work there, so they talk to the robots just to have the experience, but to really perceive or time service, they still go to the human. So it's really liked as an additional.

Yeah, as an additional service, but people still need to get used to it that robots can really do tasks and really help humans out, Because in the Netherlands, people are not used to being served by robots yet. So people do need to get. Yeah needs to get acquainted with that service. And it's more like that, the team has to do that themselves. And so that the employees can say to the guest that they need to experience the service, and just try it out and see how it works. And I guess if people know that it can really, really give a service, then it would be like, more, not just as a fun addition but really as to enhance to enhance productivity as I said before, and reduce wait times for the guests. But yeah, people still rely on people, And they're not used to be in checks in by a robot yet so they need to get familiarized and familiarized first before really liking the service I guess.

MN: Okay yeah that's very interesting that you say that a lot of people have actually mentioned that before. So, thank you for your answer, and interactive robots face a challenge in acting intelligently. What is your view in this.

E3: Yeah. Well, the thing is that people expect service robots to be very intelligence. However, they are not yet very capable of having meaningful conversations as I had before. So, people think that their robot is able to talk to speak several languages, or to feel emotions, for example, but those are things that are not yet, not yet very well done with service robots. So they do lack a bit of intelligence, see, however, because I developed a lot of well, develops, always. It can be said that in a several years, they would be more intelligence, and also the staff, for example, is able to make the robots more intelligence. So, yeah, by placing the robot in several service encounters, for example, the robot can learn from the service, it can learn from conversations that it has. So people really need to need to develop the robots as well. In order to give the good, the good service. And then the proceeds intelligence see would be higher as well. But for now, people might be disappointed with the service that they get, because they're not as intelligent as they thought the robot would be. Yeah, so there is a, indeed,



as you said, a challenge in acting intelligently, but I think during time. That could really be improved.

MN: Okay, thank you. And in addition to the question before, do you think that frontline service robots acquires and applies the knowledge and skills needed in various environments, and how does it do so.

E3: Well it can definitely acquire the knowledge and the skills needed. But like I said before, we need to develop the robots in their way of giving service and their way of interacting with people. So they need to be developed in order to acquire the skills needed, and people need to have the patience and they need to. Yeah, they need to teach the robot, in order for it to be. Yeah, to acquire their skills needed.

MN: Okay, thank you. And do you think that people question their safety or privacy when interacting with service robots.

E3: Um, well I do get that people could be afraid for their privacy because well, because AI can acquire the knowledge, but in my experience, people haven't questioned it, people haven't been worried about their privacy or anything like that. However, however when you talk about safety. I remember when I was at the henna Hotel. I've been talking to guests there as well. When I was having my dinner from the vending machine. And, well, people found it, and little bit scary, not to have other people around just robotics, and their robots have cameras as well, and you know they were a bit scared at night because they'd be, they didn't feel so safe because there weren't a lot of humans around. And I talked to one guest who was a bit scared for their privacy as the robots had cameras, and they could hear you and they moved around and it was like being in a scary movie, and one of the guests said. But as far as I know of, people aren't really afraid for the fact that a robot has their data or something so, so yeah.

MN: Okay. And is it okay if I ask you just one more question.

E3: Of course.

MN: So, if you would have to name three suggestions of what could be done to enhance customer perception on human robot interactions, what would it be?

E3: um, well for me the first one would be that a customer should not have too high of expectations of the service robots, because that is what makes them the most disappointed in the long run, as they think that they are smarter. And, yeah. And the second point would be. What I've mentioned before, is, is that it's really important for the robot to learn. Show the staff or management for guests need to be able to let the robot learn, so it can improve their tasks. That is really important. And the last one would be the last one would be that I think it's important that humans and robots will work together to really enhance the customer experience in interactions, because like I said before the henna hotel is just too much, too much robots, and no personal connection with a human employee. So I think it's important for humans and robots to work together to get Yeah, the expected service. Yeah, so I think those are my three suggestions.

MN: Okay, well thank you very much for this interview, I really appreciate your time.

E3: Yeah, no. You're welcome, and I hope this has helped for you.

Appendix 5: Consent Form

Template Informed Consent Form

Title of the research project

I, the intended research participant, have read the information for this project. I was given the opportunity to ask additional questions. If I had any questions these have been answered to my satisfaction. I have had enough time to decide whether or not I wish to participate.

I understand that my participation is completely voluntary. I understand that I am free to withdraw at any time, without giving any reason.

I understand that some people have access to my personal details. These people have been mentioned (in the information etc.).

I consent to the use of my details, for the purposes that have been mentioned in the information/information letter.

I consent to my details being kept for further analysis (if applicable) for a maximum of 15 years after this research project has ended.

I hereby give my informed consent to take part in this research project.

Name of participant: Roeland van Oers

Signature:

Date : _09_ / _08_ / _21_



Name of participant: Dominique Roos

Signature:

Date : _09_ / _08_ / _21_



Name of participant: Stan

Signature: Stan (he gave online consent)

Date : _12_ / _08_ / _21_



I, the researcher, confirm that I have fully informed this participant about the above research project.

If any new information arises in the duration of the research project that could potentially influence the participant's consent, I will inform the research participant.

Name of researcher (or his/her representative): Mireille Nije

Signature:

Date: _15_ / _08_ / _21_

Mireille Nije

Appendix 6: Confidentiality Declaration

Declaration relating to confidentiality concerning research data in Launching Your CAREer (LYCar) programme

The undersigned, Mireille Nije (hereinafter referred to as: the Student), residing in The Netherlands

Conducting a (research)project for the company WELBO/Client (Ms. de Korte)
(hereinafter referred to as: the Client), residing in: The Netherlands

Whereas:

- the Student shall, in the context of his or her LYCAR research, gain access to confidential information;
- the Client shall, where appropriate, demand a signed declaration relating to secrecy and confidentiality concerning the information provided in this context;
- this non-disclosure agreement shall, in the event of any discrepancies, take precedence over other contracts or agreements which have been or will be concluded or made between the Student and the Client;

Declares as follows:

1. The Student shall keep confidential any information which the Client or any other party involved in the LYCAR research provides under this contract, and shall not further disclose such information in any way, except insofar as the Student is obliged to disclose it by virtue of any legal requirement or irrevocable decision of a judge.
2. Information, as referred to under 1, refers to all information, including written, verbal, graphic and digital information, or information in any other form, which comes to the knowledge of the Student during the research period and which the Student knows, or can reasonably be expected to know, is of a confidential nature.
3. The Student shall not, without the prior written consent of the Client, disclose any confidential information to third parties or contribute to the publication of confidential information. The Student shall submit the thesis to the supervisor for approval from the Client in respect of confidential information, before making such information available to his examiner(s) at Hotelschool The Hague.
4. This non-disclosure agreement shall be in force for an indefinite period / The Student shall be bound to this obligation of secrecy for five (5) years after signing this declaration.
CHOOSE IN CONSULTATION WITH CLIENT)

Thus declared and signed by:

Name: Mireille Nije Date: 15 - 08 - 2021

Place: The Netherlands Student number 661623

Signature: Mireille Nije

Appendix 7: Professional Product Whitepaper

ISSUE NO. 1 | SEPTEMBER 2021

HUMAN STAFF AND SERVICE ROBOTS DO BETTER TOGETHER IN HOTEL FRONTLINE SERVICES



Guests' Perceptions on Service Robots

WRITTEN BY MIREILLE NIJE

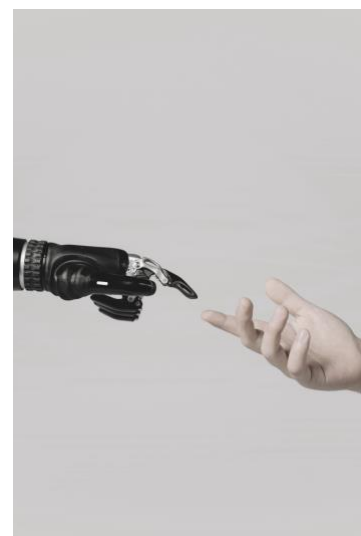
Traditionally, service providers have been humans. However, due to the rapid development of Artificial Intelligence, numerous aspects of service-oriented businesses such as the hospitality industry are expected to be influenced (1). The hotel industry is actively employing these non-human service agents throughout its operations. They are expected to carry out various frontline services, including welcoming guests, check-in, hotel guidance and product delivery. A study by Oxford Economics, believes that 20 million jobs could be replaced by robots in the next 10 years (2). Innovative hotels are increasingly adopting service robots in their frontline services. In context of users' technology adoption, presumably, each hotel guest has a different perception and attitude towards service robots. Therefore, how customers perceive service robots remains important to explore to guarantee a successful outcome of service robots in various frontline services in the hotel industry.

The following paper will give insights to:

How do guests perceive human-robot interaction provided by service robots during frontline service encounters in the hotel industry?

for some people ...

**TECHNOLOGY IS THE ELEPHANT
IN THE HOTEL LOBBY**



SERVICE ROBOTS IN HOTELS



With the considerable growth and development of robotic technology, service robots are more commonly playing an increasing role in our everyday life. Services given within hotels are no exception. Service robots are entering the hotel industry in a fast pace and are gaining attention from various hotel chains. Due to the implementation of service robots, services are expected to be profoundly changed in the near future.

Service robots are still in their developing stage in the hotel industry. Frontline service robots, as the name suggests, are meant to perform service-related tasks, which are people and service oriented through physical and social interactions (3). Henn-na hotel in Japan was the first hotel to hire service robots all-round their operation (4). Hilton worldwide provides a robot concierge that informs guests about hotel amenities and offers information about restaurants and travel tips in the destination (5). Yotel uses service robots for delivering services, storing luggage and other repetitive services (6). These technological advancements indicate that the implementation of AI, and thus service robots, greatly influence the nature of frontline services. In fact, some frontline service encounters have been redefined by Human-Robot Interaction.

Notably, service robots are able to help humans by automating basic tasks of hotel services. While the introduction of service robots can reduce waiting time, improve efficiency, and reduce labour costs, some aspects of hotel employees' services and tasks are challenging to replace and automate (7).

The success of these service robots relies upon positive perceptions of its user (8). Therefore, the characteristics of robots should be acknowledged to induce positive perceptions from consumers during the given service.

In the hotel industry, services are more exposed to direct human interaction. Research indicates that by means of multiple sensors, service robots are able to adapt to evolving situations; they are learning what service is (9). Nevertheless, Tussyadiah (10) mentioned that consumers have an unfavorable attitude towards robotic services due to the negative perception of technology in general. Despite these mixed findings, the perceived value of service robots does not derive from the robot itself, but the service it provides (11). In essence, hotels facilitate according to the guests needs and values. Note that, hotels have an opportunity to co-create the needs and values of customers with robotized service. However, what is missing from the service robot literature is a deeper understanding of the guest perception to service robots.

SERVICE ROBOTS: AT YOUR SERVICE, AS YOU WISH



I can guarantee:

**WORSE THAN AN AUTOMATED
SERVICE IS AN AUTOMATIC HUMAN
SERVICE.**

SO, WHAT DO GUESTS REALLY THINK?

Five aspects have been identified to evaluate guests' perceptions (Bartneck et al., (2009). These so-called Godspeed dimensions provide as ideal guidelines for hotels that intent to employ service robots in frontline service encounters. The Godspeed dimensions include anthropomorphism, animacy, likeability, perceived intelligence and perceived safety. Anthropomorphism refers to service robots having humanlike characteristics and impersonate human behaviors to facilitate their tasks. Animacy refers to the degree of being alive. The likeability measurement evaluates impressions that guests might have towards service robots. Perceived intelligence refers to the ability of the robot to acquire and apply knowledge and skills in various service encounters. Finally, Perceived safety indicates the guests' perception of comfort when interacting with service robots.

This paper focuses on a research paper conducted by the author Mireille Nije. To gain insights on the five Godspeed dimensions, the findings of the research were based on:

- The perspectives of guests by investigate those who have had the actual service experience with service robots.
- The perspectives of experts in the field of service robots and human-robot interaction by conducting interviews.

The findings indicate that a humanlike appearance tends to create higher expectations. In addition, a humanlike robot may not be ideal for interactions as guests find it uncomfortable. A positive perception can be enhanced with a humanoid robot that looks more machinelike than humanlike. In addition, a service robot should have human-like characteristics. A somewhat smaller service robot with proper head, eye and physical movement enhances a positive perception among guests. Overall, guests have a good impression on service robots. However, the perceptions are only positive when the service robot is placed as an additional experience. The perceptions are negative when a service is completely carried out by a service robot as it creates an impersonal experience. Therefore, robots should complement the experience and not create the experience. Both the guests and the experts mentioned that guests still rely on people. Moreover, service robots are not yet competent enough to have intelligent conversations. Due to inadequacies related to language, as well as their ability to handle guests' requests. For this reason, perceived intelligence is perceived as negative. However, service robots can be educated to improve intelligence. Finally, for perceived safety, not a lot was found in terms of guests perception on security. However, Guests did mention that having human employees in place ensures their safety.

SERVICE ROBOTS: RISING OR FALLING STARS?

To include service robots in frontline services triggers an uncomfortable feeling towards guests. But, there is no reason to fear! Service robots were not created to vanish humans from the earth. On the contrary, they were built to provide better conditions for hotel staff. Simple and repetitive activities are not that valuable to be performed by human staff. But they are important to be carried out. While robots execute the easy tasks, human staff can focus on personalizing services, treating the guests with the attention they seek. Service robots could save time and increase efficiency, so leave the simple tasks to the machines!

Guests have a negative attitude towards services that are completely carried out by service robots as it creates an impersonal experience. For most guests, technology is still a tough nut to crack. The main concern is that technology takes away the human touch and the possibility of meaningful conversations. But, no need to worry, within the hotel industry, humans will still run the show. However, that does not mean humans should perform alone, robots should be supporting actors. An automated frontline service makes it possible to improve efficiency and reduce waiting times. Therefore, investing in a partnership between human staff and robots could maximize efficiency and eventually the revenue.

For some guests, technology is the elephant in the hotel lobby. One of the reasons is the lack of robots' intelligence. However, service robots can improve their natural language by teaching it new words that enhance the vocabulary. Teaching the service robot new vocabulary could be done by hotel staff or even as a new feature that guests could enjoy! Nevertheless, guests need to feel a sense of security when interacting with service robots. Safety and security issues could arise. Therefore, it is necessary for human staff to be able to intervene at any time during any conversation the robot is having.

With this being said, adjustments to the robotic world surely have to be made. The hotel industry and its customers will have to undergo a significant shift to accept service robots. For a positive guests' perception towards human-robot interaction, people and service robots will inevitably have to coexist:

Teamwork makes the dream work!

"Humans will always be the shining star in giving service, but that does not mean humans should perform alone!"



Footnotes

- (1) Tung, V. and Au, N., 2018. Exploring customer experiences with robotics in hospitality. *International Journal of Contemporary Hospitality Management*, 30(7), pp.2680-2697.
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- (4) Guardian, 2015. Japan's robot hotel: a dinosaur at reception, a machine for room service. the Guardian. Available at: <<https://www.theguardian.com/world/2015/jul/16/japans-robot-hotel-a-dinosaur-at-reception-a-machine-for-room-service>> (Accessed 5 February 2021).
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- (6) Hochman, D., (2018). Robot butlers are taking over hotels (good news: no tipping required) Available at: www.forbes.com/sites/davidhochman/2018/02/23/robot-butlers-are-taking-over-hotels-goodnews-no-tipping-required/#67659b847636 (accessed 17 August 2021).
- (7) Lambert, J., Cone, E., 2019. How robots change the world. *Economic Outlook*, 43(3), pp.5-8.
- (8) Bartneck, C., Kulić, D., Croft, E. and Zoghbi, S., 2009. Measurement Instruments for the Anthropomorphism, Animacy, Likeability, Perceived Intelligence, and Perceived Safety of Robots. *International Journal of Social Robotics*, 1(1), pp.71-81.
- (9) de Kervenoael, R., Hasan, R., Schwob, A. and Goh, E., 2020. Leveraging human-robot interaction in hospitality services: Incorporating the role of perceived value, empathy, and information sharing into visitors' intentions to use social robots. *Tourism Management*, 78, p.104042.
- (10) Tussyadiah, I., Zach, F. and Wang, J., 2020. Do travelers trust intelligent service robots?. *Annals of Tourism Research*, 81, p.102886.
- (11) Lin, I. and Mattila, A., 2021. The Value of Service Robots from the Hotel Guest's Perspective: A Mixed-Method Approach. *International Journal of Hospitality Management*, 94, p.102876

For the full research...

CONTACT THE RESEARCHER:

MIREILLE_NIJE@HOTMAIL.COM



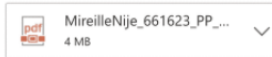
Appendix 8: Emails sent to WELBO



Mireille Nije

Di 17-8-2021 08:32

Aan: Dominique Roos



Show all 2 attachments (6 MB) Download all

Hii Dominique,

Thank you so much for the valuable information received during our interviews. As you have been interested in the results of my research. I have attached the deliverable made for Hotelschool The Hague. Please note that this cannot be published without permission. If you are interested in the rest of the research, please do not hesitate to ask. Furthermore as discussed during our meeting, I have attached the evaluation form as a second attachment. Also, we have discussed that the results of this research can be valuable for hotels that currently show interest in adopting Pepper into their team. A way to share the findings to the hotels can be very useful for them as well as for WELBO. Is there a way my findings could be shared?

Thank you in advance for all your help and valuable input,

Kind regards,

Mireille Nije

Beantwoorden | Doorsturen



Dominique Roos <dominique@welbo.eu>

Di 17-8-2021 11:29

Aan: U



Hi Mireille,

Wauw! My compliments for the whitepaper, super well done! This is very valuable indeed. I will send you the evaluation later today. If I can and if this whitepaper is meaningful for the hotels we have contact with, I will send it to them as discussed. I have another question for you. We make blogposts every month, and I was wondering if you want to do the blogpost for September. Are you able to write an article about your research? If you are able to, I will send you the requirements for writing a blog. It would be very interesting for our readers!

Thank you in advance.

Met vriendelijke groet / kind regards,



Dominique Roos
Customer Success Manager · Amsterdam
M +31 6 25 164 191

Appendix 9: Evaluation form

Evaluation Form Company Project/Research

(EVALUATION FORM OF ALL CLIENTS AND ON ALL DELIVERABLES IS COMPULSORY, FORMAT IS NOT)



Name of student:	Mireille Nij	Student number:	661623	
Name of company/organisation:	WELBO	Department:	Year 4	
Name of company tutor/research commissioner:	Dominique Roos	Position of company tutor/commissioner (if applicable):	Customer success manager at WELBO	
Project and/or Deliverable: (please specify)	Research conducted on: <i>How do guests perceive human-robot interaction provided by service robots during frontline service encounters in the hotel industry?</i>			
During the first (unofficial) evaluation the set-up for the project and end deliverable(s) is discussed. For this final evaluation the project has been delivered by the student and is thus evaluated. This is taken into consideration for the final assessment of the student.				
CATEGORY 1: EXPERTISE/KNOWLEDGE OF THE FIELD				
Rating	Excellent	Good	Room for improvement	Comments
	In-depth use of relevant literature and knowledge of the field. The deliverable shows excellent thinking capacity of the student (taking into account all significant factors and looking from all different perspectives).	Use of relevant literature and knowledge of the field. The deliverable shows mostly intellectual depth (taking into account significant factors and looking from different perspectives).	No or incorrect use of literature and knowledge of the field. The deliverable lacks intellectual depth.	
CATEGORY 2: KNOWLEDGE APPLICATION/SOLVING PROBLEMS				
Rating	Excellent	Good	Room for improvement	Comments
	The theories and models are skillfully applied and the student can translate this in a unique solution and implementation. The student can relate situations to concepts that results into a solution that adds great value to the company's overall strategy. The creative solution is/can be implemented and evaluated and is solving the problem.	The student uses theory and models and shows understanding of the issues at hand. The solution is realistic and implementable for the company. The solution is/can be implemented and evaluated.	Mentioning theory and models, but not using them in the correct way. The student cannot convince of the possibilities to implement and evaluate. It is not solving the problem.	



CATEGORY 3: INFORMED JUDGEMENTS				
Rating	Excellent	Good	Room for improvement	Comments
	The research process is done and explained in an excellent way. All statements, conclusions and recommendations are underpinned with the data collected by the students and/or referencing. The analysis is very substantial.	The research process is done and explained well. Most statements, conclusions and recommendations are underpinned with the data collected by the student and/or referencing. The analysis is substantial.	Weak problem analysis, research question not clear enough. Data collection and/or methodology is insufficient. Weak analysis, use of data from one dimension and not backed up.	
CATEGORY 4: COMMUNICATION AND SHARING KNOWLEDGE				
Rating	Excellent	Good	Room for improvement	Comments
	Excellent ability to communicate information, ideas, problems and solutions to all stakeholders involved. The deliverable adds great value to the main stakeholders. Initial and creative channels have been actively used to share outputs and knowledge.	Good ability to communicate information, ideas, problems and solutions to stakeholders. The deliverable adds value to the company. Existing channels have been used to share knowledge	The deliverable could have been better delivered to the stakeholders. The deliverable could have added more value, if better delivered. No active communication of outputs and knowledge.	
CATEGORY 5: INTERCULTURAL HOSPITALITY LEADERSHIP				
Rating	Excellent	Good	Room for improvement	Comments
	Student is able to lead the project by themselves. Student is self-critical towards improvement and takes feedback to heart. Student deals with a diversity of stakeholders in an intercultural competent way. Hospitality mindset is seen in project or work in a very distinct way.	Student is able to lead the project with little help. Student is critical towards improvement and listens to feedback. Student deals with different stakeholders. Hospitality mindset can be seen.	Tasks performed are described and not critically analyzed. Student is not too critical towards own learning and can listen better to feedback. Student does not know how to deal with differences in stakeholders. Hospitality can be improved.	
OVERALL COMMENTS:				
I enjoyed working with you Mireille! You show interest in the topic and have made a wonderful whitepaper that can be very useful for us and the hotel industry. Thank you for your interest in WELBO. Hopefully we will cross paths again in the future!				
STUDENTS' COMMENTS:				
Comments on evaluation:				
DATE & STUDENT'S SIGNATURE:			COMPANY SUPERVISOR'S/RESEARCH COMMISSIONER'S SIGNATURE:	
17-08-2021			Dominique Roos	

THE COMPLETED FORMS (ON ALL DELIVERABLES AND PERFORMANCE) NEED TO BE EMAILED TO THE LYCAR COACH AND PUT IN THE APPENDICES OF THE CAREER PORTFOLIO

Appendix 10: Godspeed Questionnaire

GODSPEED I: ANTHROPOMORPHISM

Please rate your impression of the robot on these scales:

以下のスケールに基づいてこのロボットの印象を評価してください。

Fake 偽物のような	1	2	3	4	5	Natural 自然な
Machinelike 機械的	1	2	3	4	5	Humanlike 人間的
Unconscious 意識を持たない	1	2	3	4	5	Conscious 意識を持っている
Artificial 人工的	1	2	3	4	5	Lifelike 生物的
Moving rigidly ゴチない動き	1	2	3	4	5	Moving elegantly 洗練された動き

GODSPEED II: ANIMACY

Please rate your impression of the robot on these scales:

以下のスケールに基づいてこのロボットの印象を評価してください。

Dead 死んでいる	1	2	3	4	5	Alive 生きている
Stagnant 活気のない	1	2	3	4	5	Lively 生き生きとした
Mechanical 機械的な	1	2	3	4	5	Organic 有機的な
Artificial 人工的な	1	2	3	4	5	Lifelike 生物的な
Inert 不活発な	1	2	3	4	5	Interactive 対話的な
Apathetic 無関心な	1	2	3	4	5	Responsive 反応のある

GODSPEED III: LIKEABILITY

Please rate your impression of the robot on these scales:

以下のスケールに基づいてこのロボットの印象を評価してください。

Dislike 嫌い	1	2	3	4	5	Like 好き
Unfriendly 親しみにくい	1	2	3	4	5	Friendly 親しみやすい
Unkind 不親切な	1	2	3	4	5	Kind 親切な
Unpleasant 不愉快な	1	2	3	4	5	Pleasant 愉快的な
Awful ひどい	1	2	3	4	5	Nice 良い

GODSPEED IV: PERCEIVED INTELLIGENCE

Please rate your impression of the robot on these scales:

以下のスケールに基づいてこのロボットの印象を評価してください。

Incompetent 無能な	1	2	3	4	5	Competent 有能な
Ignorant 無知な	1	2	3	4	5	Knowledgeable 物知りな
Irresponsible 無責任な	1	2	3	4	5	Responsible 責任のある
Unintelligent 知的でない,	1	2	3	4	5	Intelligent 知的な
Foolish 愚かな	1	2	3	4	5	Sensible 賢明な

GODSPEED V: PERCEIVED SAFETY

Please rate your emotional state on these scales:

以下のスケールに基づいてあなたの心の状態を評価してください。

Anxious 不安な	1	2	3	4	5	Relaxed 落ち着いた
Agitated 動揺している	1	2	3	4	5	Calm 冷静な
Quiescent 平穏な	1	2	3	4	5	Surprised 驚いた

Appendix 11: Blogpost and Newsletter

Blogpost





Newsletter September 2021 - Pepper's Got Talent

 Mireille Nije |  September 2021

Dear reader, during the summer we have been working with Mireille Nije, a student from Hotelschool The Hague. For her final thesis she researched guests' perceptions of service robots as frontline employees in the hotel industry. How customers perceive service robots remains important to explore to guarantee a successful outcome of service robots in various frontline services in the hotel industry.

The following newsletter will give insights to:

How do guests perceive human-robot interaction provided by service robots during frontline service encounters in the hotel industry?

[Continue reading >](#)

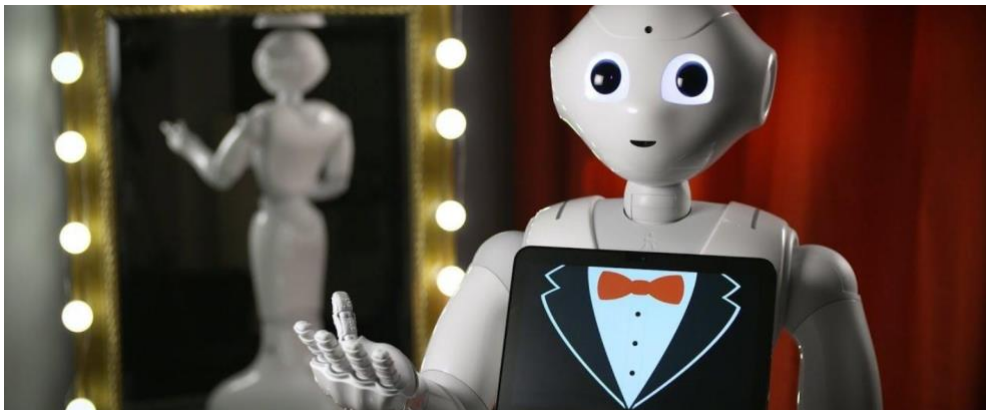
- ✕ Newsletter June 2021 – Reconnect your workplace with Temi
- ✕ Newsletter May 2021 – Reconnect Your Workplace With Social Robots
- ✕ Newsletter April 2021 – Spring is here: new robots and helpful features
- ✕ Discover how social robots optimize banking hospitality services

Newsletter

Newsletter September 2021 - Pepper's Got Talent

In this newspaper we will discuss the best way to provide the best service and experience to your customers. A hot topic for hotel managers who are interested in innovative technology. Let's find out if Pepper is suited for providing the best service and experience to your customers!

Pepper: A Rising or Falling Star



First, a little introduction to my research. The hotel industry is actively employing Pepper service robots throughout its operations. They are expected to carry out various frontline services, including welcoming guests, check-in, hotel guidance and product delivery. presumably, each hotel guest has a different perception and attitude towards service robots. Therefore, how customers perceive service robots remains important to explore to guarantee a successful outcome of service robots in various frontline services in the hotel industry.

The following newsletter will give insights to:

How do guests perceive human-robot interaction provided by service robots during frontline service encounters in the hotel industry?

Pepper: Teamwork Makes The Dream Work

To include Pepper in frontline services triggers an uncomfortable feeling towards guests. But, there is no reason to fear! Service robots were not created to vanish humans from the earth. On the contrary, they were built to provide better conditions for hotel staff. Simple and repetitive activities are not that valuable to be performed by human staff. But they are important to be carried out. While robots execute the easy tasks, human staff can focus on personalizing services, treating the guests with the attention they seek. Service robots could save time and increase efficiency, so leave the simple tasks to the machines!

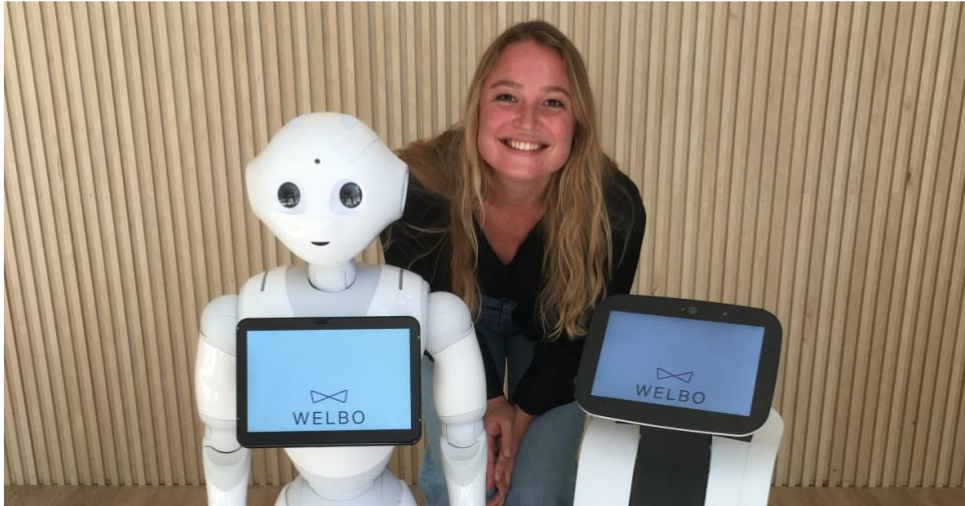
Guests have a negative attitude towards services that are completely carried out by service robots as it creates an impersonal experience. For most guests, technology is still a tough nut to crack. The main concern is that technology takes away the human touch and the possibility of meaningful conversations. But, no need to worry, within the hotel industry, humans will still run the show. However, that does not mean humans should perform alone, robots should be supporting actors. An automated frontline service makes it possible to improve efficiency and reduce waiting times. Therefore, investing in a partnership between human staff and robots could maximize efficiency and eventually the revenue.

For some guests, technology is the elephant in the hotel lobby. One of the reasons is the lack of robots' intelligence. However, service robots can improve their natural language by teaching it new words that enhance the vocabulary. Teaching the service robot new vocabulary could be done by hotel staff or even as a new feature that guests could enjoy! Nevertheless, guests need to feel a sense of security when interacting with service robots. Safety and security issues could arise. Therefore, it is necessary for human staff to be able to intervene at any time during any conversation the robot is having.

With this being said, adjustments to the robotic world surely have to be made. The hotel industry and its customers will have to undergo a significant shift to accept service robots. For a positive guests' perception towards human-robot interaction, people and service robots will inevitably have to coexist:

Teamwork makes the dream work!

Pepper and Humans Do Better Together!



Interested in the full research? Contact the researcher!

mireille_nije@hotmail.com

+316 14 67 41 44



Appendix 12: Email Confirmation Dr. Hindriks



Mireille Nije

Di 31-8-2021 14:49

Aan: koen Hindriks

Dear prof. dr. Hindriks,

I Hope this email finds you well.

Allow me to introduce myself. My name is Mireille Nije and I am a student at Hotelschool The Hague.

I am currently doing my final thesis on guests' perceptions of service robots as frontline employees in the hotel industry. My research can be very valuable for the academic community and academic researchers that are currently looking into service robots and human-robot interaction. I found that you are professor of the Network Institute of the VU. I would very much like to contribute my research to the institute. I would like my research to be shared and I hope that you are the right person to contact for this and that you would be so kind to assist me in this contribution.

If so, I can send you my research in its entirety next week.

I look forward to your response,

Kind regards,
Mireille Nije

[Beantwoorden](#) | [Doorsturen](#)



k.v.hindriks@vu.nl

Vr 3-9-2021 13:44

Aan: U

Dear Mireille,

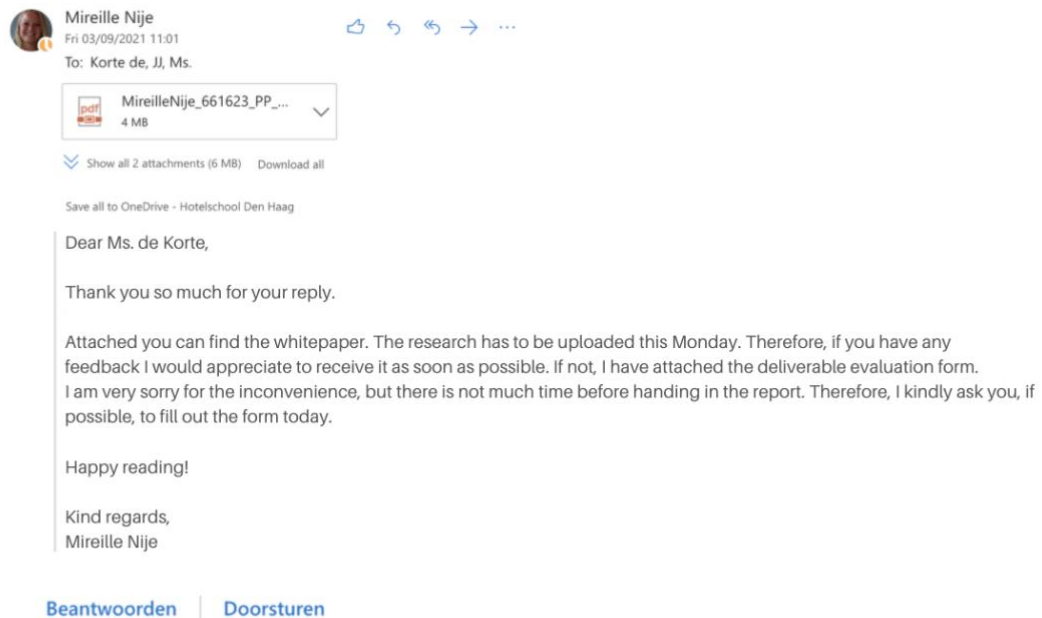
Normally we share the research done by students from the VU in the network institute.

However you got me very curious about the research that you have done. It could indeed be very valuable to share with the academic community. I'll see what I can do for you. You have chosen a very interesting topic to research. I am looking forward to reading your thesis. Hopefully we will stay in touch.

Koen Hindriks

Appendix 13: Email confirmation and Evaluation Ms. de Korte

Email Confirmation





Evaluation Ms. de Korte

Evaluation Form Company Project/Research

(EVALUATION FORM OF ALL CLIENTS AND ON ALL DELIVERABLES IS COMPULSORY, FORMAT IS NOT)



Name of student:	Mireille Nije	Student number:	661623
Name of company/organisation:	Hotelschool The Hague	Department:	Year 4
Name of company tutor/research commissioner:	Ms. de Korte	Position of company tutor/commissioner (if applicable):	Lecturer
Project and/or Deliverable: (please specify)	Research conducted on: <i>How do guests perceive human-robot interaction provided by service robots during frontline service encounters in the hotel industry?</i>		

During the first (unofficial) evaluation the set-up for the project and end deliverable(s) is discussed. For this final evaluation the project has been delivered by the student and is thus evaluated. This is taken into consideration for the final assessment of the student.

CATEGORY 1: EXPERTISE/KNOWLEDGE OF THE FIELD

Rating	Excellent	Good	Room for improvement	Comments
	In-depth use of relevant literature and knowledge of the field. The deliverable shows excellent thinking capacity of the student (taking into account all significant factors and looking from all different perspectives).	Use of relevant literature and knowledge of the field. The deliverable shows mostly intellectual depth (taking into account significant factors and looking from different perspectives).	No or incorrect use of literature and knowledge of the field. The deliverable lacks intellectual depth.	Well informed research based on relevant sources/literature, interesting and relevant perspectives are presented. Project is well underpinned.

CATEGORY 2: KNOWLEDGE APPLICATION/SOLVING PROBLEMS

Rating	Excellent	Good	Room for improvement	Comments
	The theories and models are skillfully applied and the student can translate this in a unique solution and implementation. The student can relate situations to concepts that results into a solution that adds great value to the company's overall strategy. The creative solution is/can be implemented and evaluated and is solving the problem.	The student uses theory and models and shows understanding of the issues at hand. The solution is realistic and implementable for the company. The solution is/can be implemented and evaluated.	Mentioning theory and models, but not using them in the correct way. The student cannot convince of the possibilities to implement and evaluate. It is not solving the problem.	Interesting paper based on the research findings.

CATEGORY 3: INFORMED JUDGEMENTS

Rating	Excellent	Good	Room for improvement	Comments
	The research process is done and explained in an excellent way. All statements, conclusions and recommendations are underpinned with the data collected by the students and/or referencing. The analysis is very substantial.	The research process is done and explained well. Most statements, conclusions and recommendations are underpinned with the data collected by the student and/or referencing. The analysis is substantial.	Weak problem analysis, research question not clear enough. Data collection and/or methodology is insufficient. Weak analysis, use of data from one dimension and not backed up.	Research may have been informed/inspired by previous LYCAR student and has been extended with reviews for other hotels that employ service robots. Interesting research design. Sound analysis.

CATEGORY 4: COMMUNICATION AND SHARING KNOWLEDGE

Rating	Excellent	Good	Room for improvement	Comments
	Excellent ability to communicate information, ideas, problems and solutions to all stakeholders involved. The deliverable adds great value to the main stakeholders. Initial and creative channels have been actively used to share outputs and knowledge.	Good ability to communicate information, ideas, problems and solutions to stakeholders. The deliverable adds value to the company. Existing channels have been used to share knowledge.	The deliverable could have been better delivered to the stakeholders. The deliverable could have added more value, if better delivered. No active communication of outputs and knowledge.	Deliverables are well written and well taken care of.

CATEGORY 5: INTERCULTURAL HOSPITALITY LEADERSHIP

Rating	Excellent	Good	Room for improvement	Comments
	Student is able to lead the project by themselves. Student is self-critical towards improvement and takes feedback to heart. Student deals with a diversity of stakeholders in an intercultural competent way. Hospitality mindset is seen in project or work in a very distinct way.	Student is able to lead the project with little help. Student is critical towards improvement and listens to feedback. Student deals with different stakeholders. Hospitality mindset can be seen.	Tasks performed are described and not critically analyzed. Student is not too critical towards own learning and can listen better to feedback. Student does not know how to deal with differences in stakeholders. Hospitality can be improved.	Unfortunately we did not have a lot of contact during design and execution of the research (also from my side).

OVERALL COMMENTS:

I think you did a very good job and can be proud! Congratulations.

STUDENTS' COMMENTS:

Comments on evaluation:	
DATE & STUDENT'S SIGNATURE:	COMPANY SUPERVISOR'S/RESEARCH COMMISSIONER'S SIGNATURE:
	06.09.2021

THE COMPLETED FORMS (ON ALL DELIVERABLES AND PERFORMANCE) NEED TO BE EMAILED TO THE LYCAR COACH AND PUT IN THE APPENDICES OF THE CAREER PORTFOLIO

Appendix 14: Proof of EC's

J.M. Nije

Study Progress Overview

Student number	661623
Date	5 September 2021
Degree programme	B Hospitality Management - Full-time
Cohort	2016
Study programme	PP-HTH-C08-17 - Post-Propedeutic curr.2008 version 2015

European Credits (EC)

Study programme	Minimum credits to be obtained	Credits obtained	Passed
Basic Programme	180.0	150.0	No
Others		0.0	
Total	180.0	150.0	No

Programme

Study programme component	Type	Minimum credits to be obtained	Credits obtained	Passed
<i>all of the parts below</i>				
1 Compulsory courses phase 2	Mandatory	84.0	84.0	Yes
2 Business other language		6.0	6.0	Yes
<i>one of the parts below</i>				
2.1 Business other language: Dutch	Restricted choice	6.0		
2.2 Business other language: French	Restricted choice	6.0		
2.3 Business other language: Spanish	Restricted choice	6.0	6.0	Yes
2.4 Business other language: German	Restricted choice	6.0		
2.5 Business other language: Russian	Restricted choice	6.0		
2.6 Business other language: Mandarin Chinese	Restricted choice	6.0		
3 Compulsory courses phase 3 - part 1	Mandatory	30.0	30.0	Yes
4 Phase 4 compulsory courses		60.0	30.0	No
<i>one of the parts below</i>				
4.1 P4 compulsory		60.0	30.0	No
<i>all of the parts below</i>				
4.1.1 Minor	Minor or electives	12.0	12.0	Yes
4.1.2 P4 Graduation courses	Mandatory	48.0	18.0	No
4.2 Premaster compulsory courses	Specialisation	60.0		
Total		180.0	150.0	No

Minor Electives

Study programme component	Type	Minimum credits to be obtained	Credits obtained	Passed
<i>all of the parts below</i>				
1 Electives	Restricted choice	12.0	12.0	Yes
Total		12.0	12.0	Yes

Appendix 15: Proof of data submission

File Upload Notification



noreply <noreply@hotelschool.nl>



Sun 05/09/2021 19:33

To: Mireille Nije

Dear Mireille Nije,

This is an automatic delivery message to notify you that a new file has been uploaded.

Name : Mireille Nije
Student Number : 661623
Email : 661623@hotelschool.nl
LYCar Coach : GOV
Research Number : 2021-220

We kindly request you to forward this email to your LYCar coach as evidence that your data files have been uploaded securely.
Thank You.

[Reply](#) | [Forward](#)

Appendix 16: Proof of word count

