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AN INVESTIGATION INTO THE IMPACT OF ROBOTIC SERVICE ON SERVICE DELIVERY AND CONSUMER EXPERIENCE

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Paper Abstract

Purpose – Despite growing attention being given to robot service and its effect on the hospitality service industry, there are limited studies which give light to the effect this has on purchase intention (Zhong, Sun, Law & Zhang, 2020), service design and consumer experience from the consumer's perspective. The purpose of this research is to investigate how robot service impacts consumer experience, with the aim of providing industry knowledge to hoteliers with recommendations for operational decisions.

Design/Methodology/Approach – A questionnaire was used to investigate the effect of robots on service delivery and consumer experience.

Findings – This research found a preference for a dualistic approach to service, whereby service is provided by both humans and robots. Findings also suggested a consumer reluctance to accept robot service as the future of hospitality.

Originality – This study has theoretical value by its contribution to hospitality industry knowledge and current literature regarding consumer preference towards robotic service, and practical value by informing hoteliers on engagement between robots and consumers.

Keywords: Robot hotel service, Consumer, Purchase intention, Service delivery.

INTRODUCTION

The hotel sector has been advancing to incorporate robots into service and operations, assisting with decisions on maximising occupancy, promotional offers, and long and short-

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term pricing strategies (Herbert, Dhayalan & Scott, 2016). With service industrialization rapidly increasing (Wirtz et al., 2018) the hotel industry as we know it could potentially look very different, apparent by recent data forecasting an estimated robot service value of $3,083million by 2030, up from $295.5million in 2020 (Research and Markets, 2021), suggesting further integration of robot service in the hospitality industry.

This integration of robot service is shifting the service paradigm towards a high-tech future, with various sections of the service experience expected to present robot technology by 2025 (Zeng, Chen & Lew, 2020; Van Doorn et al., 2017). Despite robots' evident increasing popularity in hotel organisations, there is limited evidence supporting the implementation of robot service from a consumer's point of view.

The aim of this research is to investigate the impact robot service has on service delivery and guest experience. The objectives of this research are:

- To review literature on service delivery, experience, value, recovery, and engagement
- To utilise a questionnaire to understand the impacts of robot service on service delivery and consumer experience
- To examine Bitner's (1992) Servicescape to analyse the effects robots have on individual areas of the service experience
- To provide recommendations to the hospitality industry on engaging with robot service.

LITERATURE REVIEW

Service Value and Engagement

The Covid-19 pandemic has been a catalyst towards a high-tech/low-touch future in hospitality (Hao & Chon, 2021) following the demand for contactless services. In line with this demand, an increasing number of robots are being programmed to perform frontline tasks such as serving food and talking to guests (Kim, Yoo & Jeon, 2021). This engages guests socially and highlights an emergence of robots from solely industrial responsibilities to social acts. With facial and expression recognition as well as language capabilities

(Niemelä, Heikkilä, Lammi & Oksman, 2019) robots can connect with consumers socially, operating skills that may be hard to find in human employees, such as being able to speak multiple languages. Pinillos, Marcos, Feliz, Zalama and Gómez-García-Bermejo (2016) claim robot service should be offered at an affordable price however this raises the question, if sold cheaper, would robots still be perceived as a valuable service facility?

Perceived service value is determined by the consumer; therefore, robot service must be engaging at a consumer level. Responsiveness is a key factor in service quality (Li, Yin, Qiu & Bai, 2021). This means consumer engagement is vital in ensuring the long-term success of initiatives like robot service. The engagement of consumers and robots creates a new sense of value by adding to the service experience. In addition to this, robots' low-level, self-learning capability, such as in the case of Amazon's Alexa, allows them to learn consumer needs/preferences (Dawar & Bendle, 2018), however Alexa would be incapable of holding a conversation. A study conducted by Pollmann, Ruff, Vetter and Zimmermann (2020) investigated if the entertainment value from robots came from the voice interaction or physical presence. The study found an increase in perceived entertainment experience when participants engaged with robot, Pepper, as opposed to artificial intelligence assistant, Alexa. This suggests that the physical presence of a robot is of higher service value and allows for increased engagement.

Xiao (2021) reports the importance of standardisation when ensuring a consistent quality of service and engagement across all hotels of the same brand. This standardisation is a tool which gives value to a hotel's brand and reputation; as robots are programmed to provide service, the efficiency and accuracy they provide can prove invaluable to an organisation and its operational decisions. There are many factors to consider when evaluating the difference in service at a luxury hotel in comparison to a budget hotel however, a key component is the level of service. Hotels in the luxury sector focus on providing a highly personalised service to create value in their brand and service experience (Bharwani & Mathews, 2021). Volchek, Law, Buhalis and Song (2020) support this, stating personalisation helps to add value to service and increase guest satisfaction. A study conducted by Chan and Tung (2019) found that, although robot service positively influenced the ratings for budget and midscale hotels, the same cannot be said for luxury hotels. This

suggests a downfall in service quality when incorporating robots to luxury hotels, most likely due to the lack of personalisation to support the luxury experience.

In contrast to this, Hollebeek, Sprott and Brady (2021) report an increased level of personalised service from current robot interactions, reducing service errors and suggesting a higher quality service experience. In addition to this, Wilson and Daugherty (2018) report that the collaboration between humans and machines significantly improves business performance. This suggests a holistic benefit to the hospitality industry provided by the implementation of robot service, given that this broad statement is not specific to hotel sectors. Furthermore, the provision of robot service is important to improve a hotel's position on the competitive market however, the provision of personalised service remains disputed (Naumov, 2019).

The Servicescape

The integration of robot service impacts different touch points of the service experience. Bitner's (1992) Servicescape model (seen in Figure 1) explores this by categorising these touch points, highlighting how the physical aspects and design of a service environment influence consumer behaviour. McKenzie (2021) defines Servicescapes as a way for consumers to form impressions of businesses providing an intangible service as, or before, they enter the physical area of service consumption.

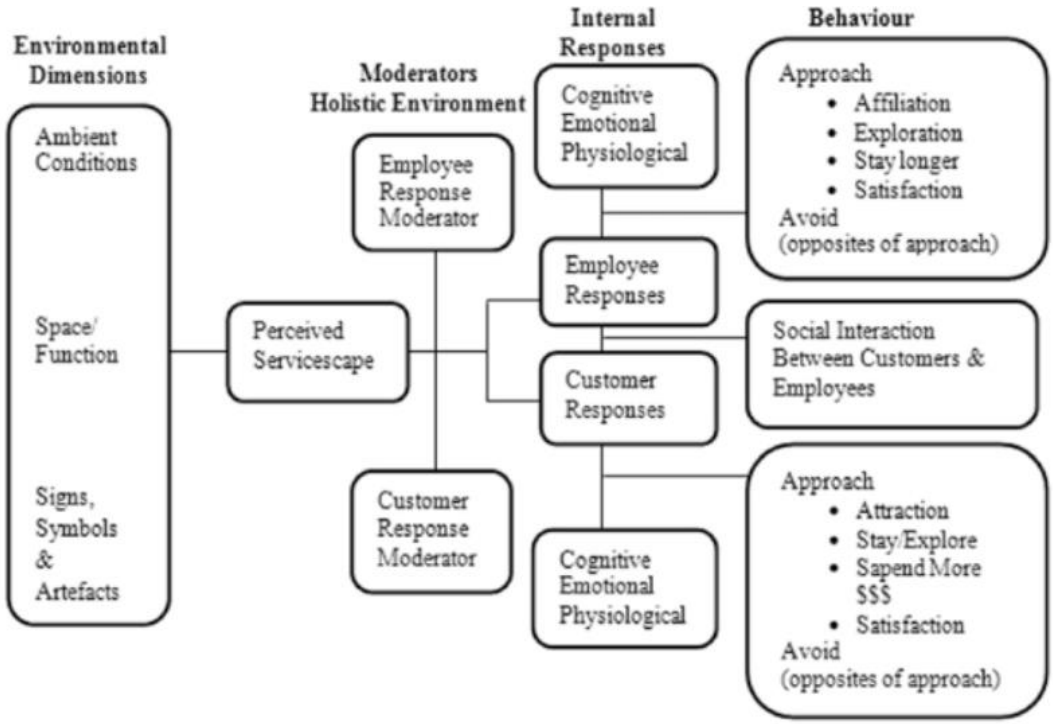
Service robots are used for automating service. Subsequently, applying this to the Servicescape model, the question is prompted of how does an automated service influence consumer behaviour? Robots present a change in servicescape due to an alteration of workflow (Ivanov, Gretzel, Berezina, Sigala & Webster, 2019). Ivanov et al. (2019) continue, exploring the various sectors robots can be integrated in a hotel, such as bars and restaurants to mitigate any shortage of labour. The environmental dimensions within the servicescape include ambient conditions, space function, and signs, symbols are artifacts. Rashid, Ma'amor, Ariffin and Achim (2015) describe space function as an array of machinery, equipment and furniture in service areas that assist with the delivery of service. Service robots can be categorised into this area given they are essentially part of the service equipment, however their interaction with consumers, providing an intangible service experience, promotes a new dimension to this framework, potentially changing the model.

McLeay, Osburg, Yoganathan and Patterson (2020) touch upon a consumer's internal response, stating that robots could make consumers uncomfortable due a perceived threat to identity. The resulting behaviour in this scenario could result in the consumer avoiding that service or hotel.

Hospitality is based on the premise of emotional service by human employees (Golubovskaya, Robinson & Solnet, 2017), therefore, when evaluating different areas of service in a hotel, literature suggests a consumer preference for robots to serve in areas with less emotional involvement, such as food preparation. In support of this, research conducted by Chan and Tung (2019) found human staff to be better than robots at forming a relationship with guests and the hotel brand, regardless of the classification of hotels. This means that even in hotels providing a less personalised service, consumers still prefer the emotional interaction from human staff. In contrast to this, Murphy, Gretzel and Pesonen (2019) state how anthropomorphism in service robots may result in an increased perception of trust from consumers, suggesting a higher quality of engagement from this trusting relationship. The idea this presents is that the more human-like a robot is in terms of interaction capability, the higher the level of trust and therefore, engagement consumers will show.

Relating this literature back to the Servicescape model, if a hotel operating service robots wishes to positively influence a consumer's behaviour, resulting in satisfaction, a strong affiliation with the brand, and a willingness to return/stay longer, research would suggest they must ensure a high level of anthropomorphism in their service robots. However, contrasting research describing threat to human identity argues that, to mitigate this, service robots should have low levels of anthropomorphism. Additionally, Henn na Hotel in Japan, the first robot hotel, had to fire many of their robots including robot porters with the reasoning that they were slow and the physical layout of the property (relating to space function) affected their ability to reach most rooms, therefore they could not be utilised by all the guests (Ivanov, Webster & Berezina, 2020). Ultimately, the dimensions within the servicescape model all prove to influence consumer behaviour i.e., their willingness to purchase a product, or in a hotel-specific scenario, book a longer stay.

Figure 1 – Bitner's Servicescape Model



(Bitner, 1992)

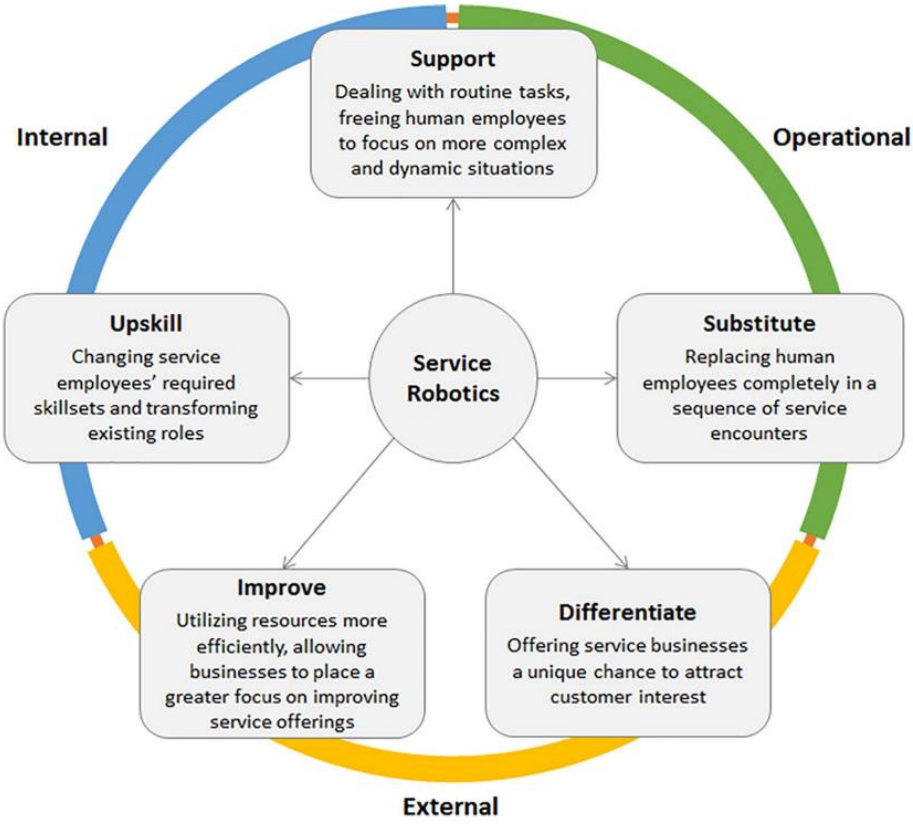
Service Recovery and Delivery

Service failure generally occurs through human error, which can result in dissatisfied consumers and negative reputation leading to a loss in revenue (Wu, Qomariyah, Sa & Liao, 2018). With growing integration of robots in the hotel industry, this raises the question of how consumers would react in response to robot service failure. Choi, Mattila and Bolton (2020) investigate this, reporting that consumer satisfaction is enhanced through human intervention following robot service failure, however data showed that humanoid robots were able to recover service without the need for human intervention. These findings are contingent with the idea that consumers prefer humans to handle service recovery, with them responding better to robots depending on the level of humanoid and anthropomorphic qualities they possess. Mende, Scott and Bolton (2018) support this, reporting consumer's reactions to robots is dependent on their functional as well as social capabilities.

Research notes non-verbal communication, such as facial expression, as important for service delivery and recovery (Pantano, 2020). Sophia, an anthropomorphic robot capable of 60+ emotions (Faraj et al., 2021), is an example of the advancement of technology in the hotel industry, as well as the key drive to influence consumer emotions to facilitate engagement and benefit value co-creation (Rincon, Costa, Novais, Julian & Carrascosa, 2019; Neuhofer, Magnus & Celuch, 2020). Despite the engaging qualities of humanoid robots, McLeay et al. (2020) claim that they could negatively impact service by creating a threat to human identity or making consumers uncomfortable. Supporting this, Tussyadiah, Zach and Wang (2020) find anthropomorphism to be the main factor inhibiting consumer's acceptance of service robots. This suggests a level of unwillingness to engage with anthropomorphic robots, which is inconsistent with Mende, Scott and Bolton's (2018) research, who suggest these anthropomorphic abilities encourage engagement.

Service robots have various roles in service encounters. Figure 2 shows Tuomi, Tussyadiah & Stienmetz's (2021) model, highlighting the operational, external and internal roles of service robots, specifically noting their ability to assist a hotel in their differentiation strategy. Involving the creation of a unique product/service (Tavitiyaman, Zhang, Wei & Saiprasert, 2018), differentiation allows a hotel to cement their position in the preference of consumers (Lee, Oh & Hsu, 2017). This increased preference supports the notion that robots add value to a service experience. The model also explores the supporting role of service robots with routine tasks. The integration of robots in service allows employees to focus on tasks requiring emotional intelligence (Tuomi, Tussyadiah & Stienmetz, 2021). The reduction of repetitive tasks such as processing transactions suggests employees could benefit from increased motivation at work, and businesses from increased efficiency.

Figure 2 – Roles of Service Robotics in Service Encounters



(Tuomi, Tussyadiah & Stienmetz, 2021)

Service delivery influences consumer service evaluation through human-to human interaction (Dedeoglu, Bilgihan, Ye, Buonincontri & Okumus, 2018). By adopting artificial empathetic intelligence, service robots can interact with consumers, providing them with personalised experiences (West, Clifford & Atkinson, 2018). This imitation of human interaction serves to benefit service delivery, specifically standardisation, personalisation and relationalisation, as seen in Figure 3 With the ability to minimise variability and increase efficiency by automating service, robots can learn consumer preferences and optimise service, such as is the case of Amazon's recommendation system (Huang & Rust, 2020).

Figure 3 – Robot Benefits to Service

(Huang & Rust, 2020)

Weiss, Bernhaupt, Lankes and Tscheligi (2011) present an evaluation model which can be used to assess collaboration between humans and robots in a working environment (see Appendix 1). The model explores four categories: usability which explores the efficiency; social acceptance which explores performance and effort expectancy; user experience which evaluates co-experience and feeling of security; and finally, societal impact which explores the effect of robots on culture. This framework is useful when evaluating the impact of robots on service delivery as it provides a holistic group of factors to consider when integrating robots into a collaborative working environment. The benefit to this framework is its focus on social and emotional integration, considering a consumer's perspective, not solely usability.

METHODOLOGY

Quantitative Data: Questionnaire/Survey

A questionnaire was chosen as the research method for this project as questionnaires are inexpensive and economical (Patten, 2016). Questionnaires, due to the anonymity of responses can produce accurate and relevant data (Taherdoost, 2016). Respondents are more inclined to answer truthfully if they feel confident their responses are anonymous and confidential. By utilising a variety of question types such as open-ended and multiple choice,

the risk of survey fatigue is reduced as a range of question types can prevent boredom, as supported by Zhang (2018). Questionnaires also offer easy analysis due to built-in features of the survey platform, in this case Qualtrics, which allowed for data to be quantified.

The disadvantages to questionnaires include dishonest answers; participants may not feel confident in how their data is going to be used; this risk has been mitigated by ensuring participants were made aware that their answers are strictly anonymous, and all data held for research would remain confidential. This helped to ensure honest answers which in turn increased the reliability and validity of the data. Another disadvantage to questionnaires is survey fatigue. Participants can become bored and possibly skip questions or give vague responses. Patten (2016) states how participants can potentially answer with the first response that comes to mind, therefore affecting how in-depth responses are. This area was mitigated by limiting the number of questions in the survey and making participants aware of how many questions there were and how long it was expected to take before they committed to taking part.

Methods such as focus groups would not have been effective to use for this research as they are too time consuming. To gather data that is representative of a national population, the research method needed to be effective at gathering many responses in a short space of time. Mishra (2016) reports 6-8 participants as the optimum number for focus groups, with larger group sizes becoming chaotic due to too many participants contributing to discussion, therefore focus groups, despite the benefits of being able to ask further questions to participants, would not have been useful in this case. Another method which would not have been effective is interviews which, similarly, to focus groups, can be costly and time-consuming (Sociology Group, 2021). Debois (2019) explores how having a researcher present has been shown to affect participant's responses due to an increase in more socially desirable responses. This means participants can be influenced through discussion; this creates bias which affects the truthfulness (Brace, 2018) and validity of the data as responses may not be honest. Standardisation can also be impacted in focus groups and interviews due to the ability to ask further questions during discussion. Although this can be seen as beneficial to research, including being described by Mishra (2016) as a reflection of the diverse nature of research populations, it affects the reliability of data as the information

gathered from one focus group/interview will differ from the next. The data collection time frame for this research was from 02/12/21 to 15/12/21.

The questionnaire design was shaped by trends in current literature and developed into a structured flow/format for improved readability. The literature review was used to formulate questions surrounding the research topic (see Appendix 2 for a copy of the questions).

RESULTS AND DISCUSSION

Sample

The sample for this survey was accessed by reaching out to hotel consumers through the process of posting the Qualtrics questionnaire link on social media platforms Facebook and LinkedIn. This sample was determined by including a question which asked if the participant had ever had a robot experience in a hotel. The questionnaire was distributed to known contacts using convenience sampling; this was then reshared on Facebook after a week to try and increase exposure/reach. The survey received 55 of responses, however 8 of these were incomplete and have therefore been excluded from the resulting data.

Despite the disadvantage of convenience sampling being unable to make statistically indicative conclusions (Galloway, 2005), the method is simple, cost effective and allows for facilitation of data collection in a limited period (Dudovskiy, 2021). Convenience sampling is a non-probability sampling method allowing researchers to gain theoretical insights surrounding the research topic (Saunders, Lewis & Thornhill, 2019).

Data was analysed through Qualtrics and Excel, forming graphs to map data, facilitating efficient analysis of key trends. Ethics has been adhered to by gaining informed consent from each participant as well as asking them to confirm they are over the age of 18. Responses were also anonymous to protect participants and ensure their trust in the study. See Appendix 3 for further exploration on the study of ethics.

Age and Educational Level

Participants were asked to state their age category seen in Figure 4, categorised by generational status i.e., Millennials, and the highest level of education they have received,

seen in Figure 5. These questions allow for an analysis of whether age and education play a role in participant's perceptions on robot service. Figure 5 shows that of 47 participants, 24 had a university level education, 18 had a college/6th form education, and 5 had achieved education at a high school level.

Figure 4

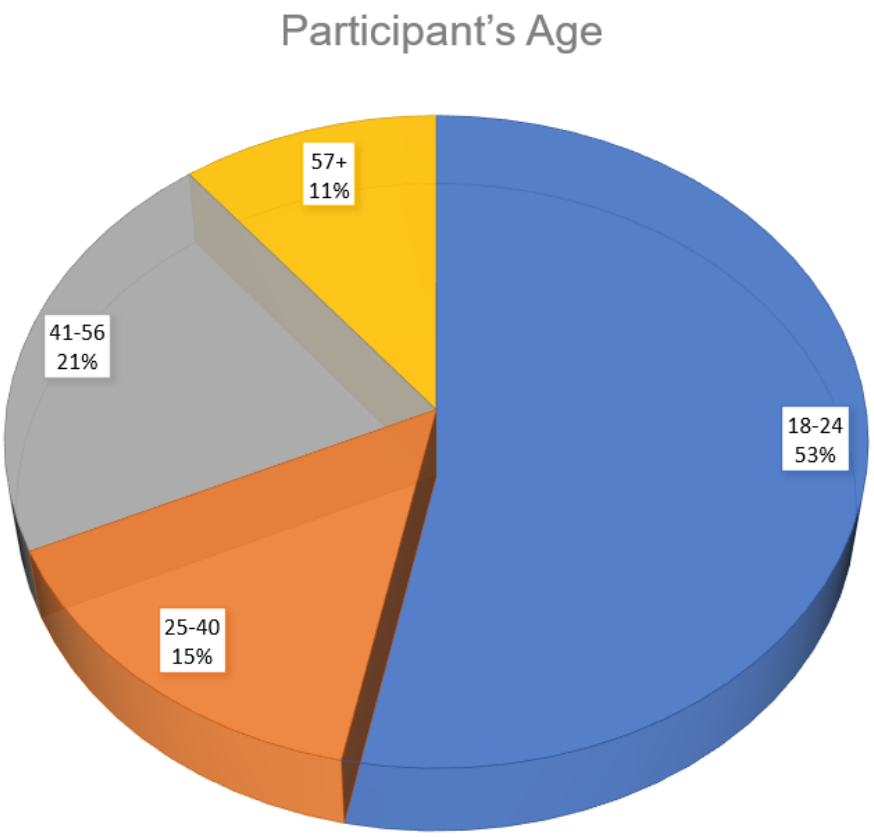
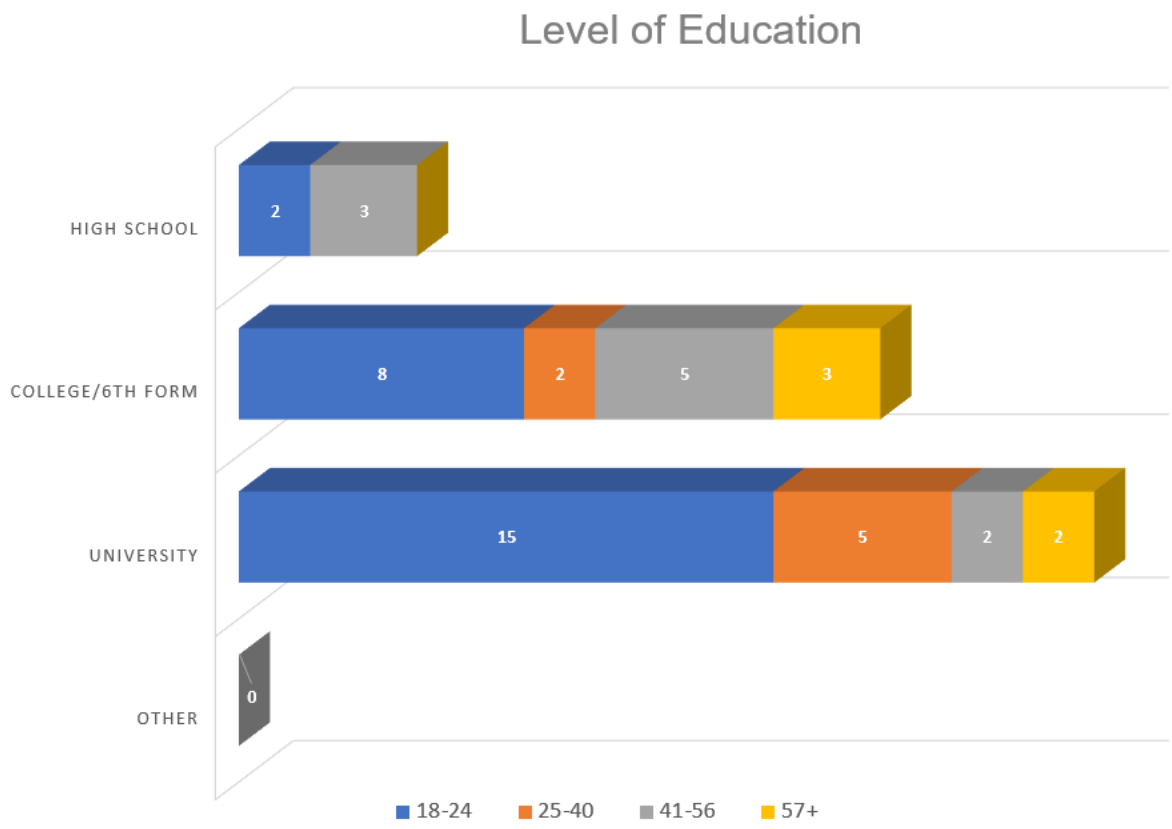


Figure 5



Experience and Agreement

Particiants were asked if they had ever had a robot experience in a hotel. Figure 6 shows that 2 participants aged 18-24, 1 aged 25-40, and 3 aged 41-56 had each had experiences with robot service. In terms of data collection, this allows for a richer sample, given the first-hand knowledge these participants have, as well as the various age categories, assisting with highlighting trends in generational preference.

Figure 6

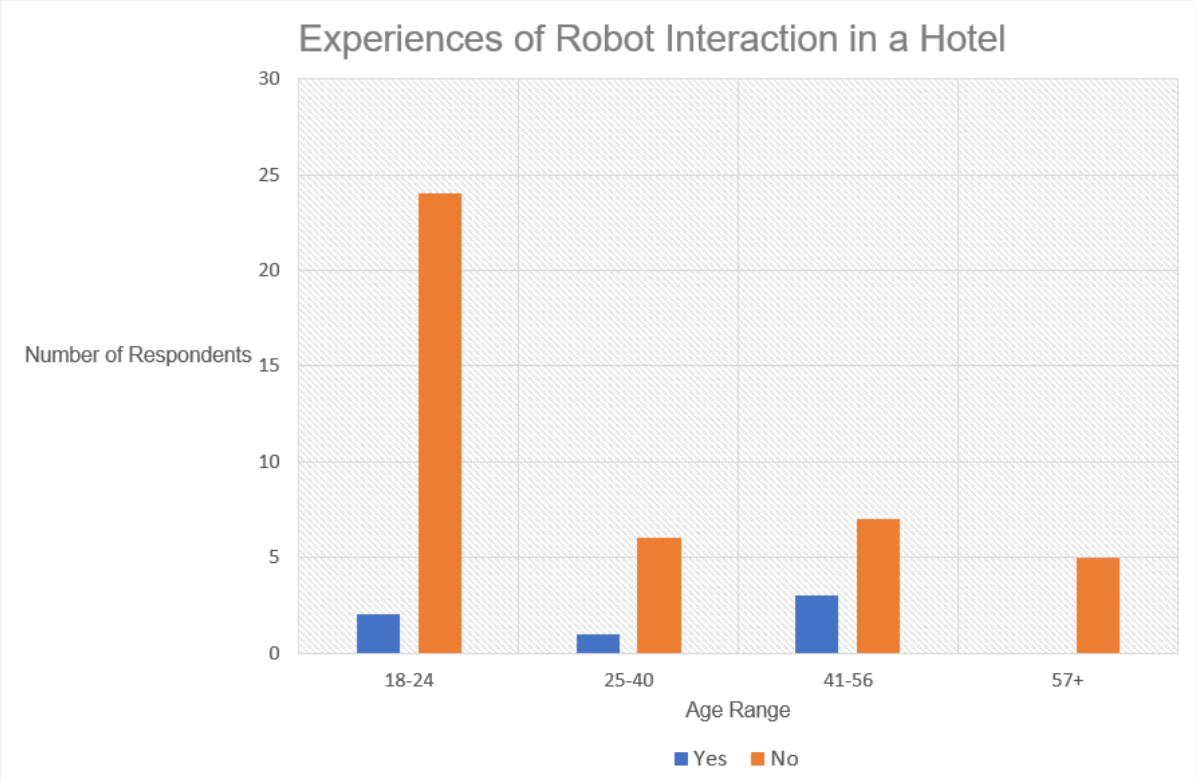
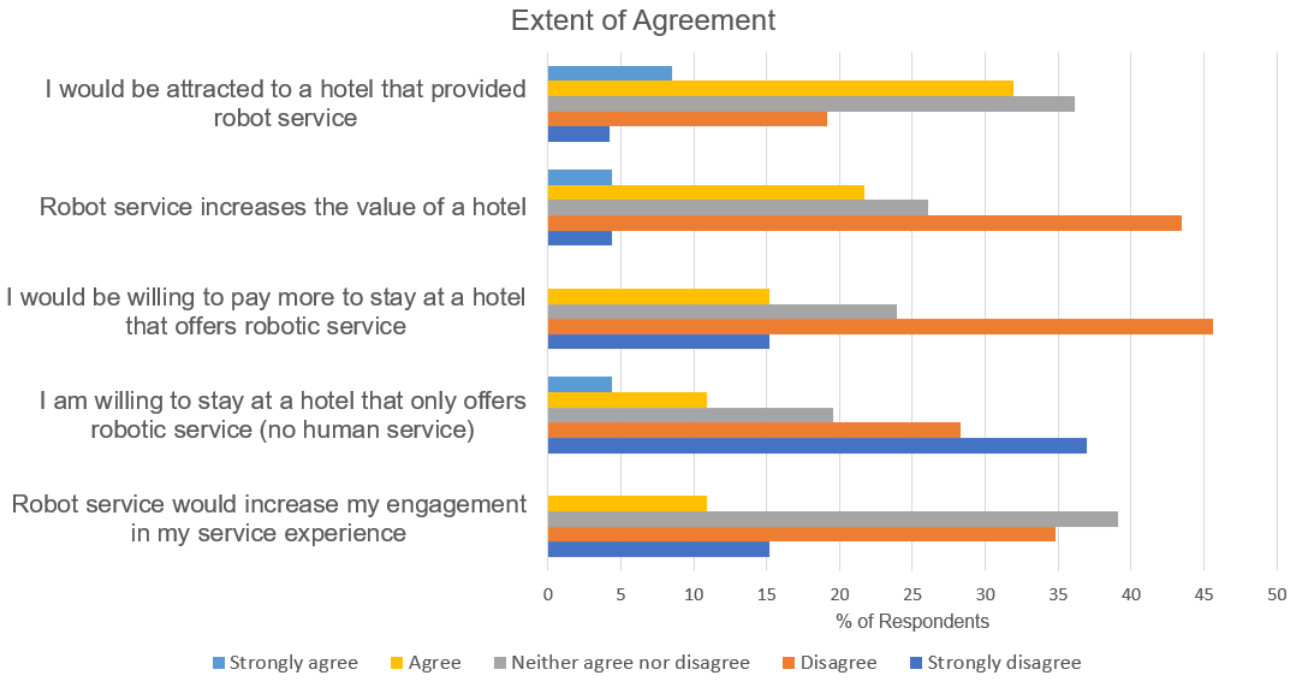


Figure 7 shows a range of statements where participants were asked to rate their extent of agreement. The data showed that although 40.5% of participants selected 'Agree'/'Strongly agree' in response to if they would be attracted to a hotel providing robot service, only 26% of respondents agreed that it would increase the value of a hotel. This conflicts with Primawati's (2018) paper reporting the value robots provide to a hotel and its competitive position. In addition, 50% of respondents chose 'Disagree'/'Strongly disagree' when asked if they believed robot service would increase their engagement. This opposes Lin (2015) who reports robotics provide an innovative service experience helping to improve consumer engagement. The consensus from this population is that the majority would not be willing to pay more to stay at a hotel providing robot service, which corresponds to the data presenting no increase in value perception. This population included 65.22% of participants who would not be willing to stay at a hotel with no human service, with only 15.22% of participants stating they would. This suggests, despite the shifting service paradigm through

the integration of robots (Zeng et al., 2020), consumers prefer the traditional face-to-face human service, perceiving this as more valuable.

Figure 7



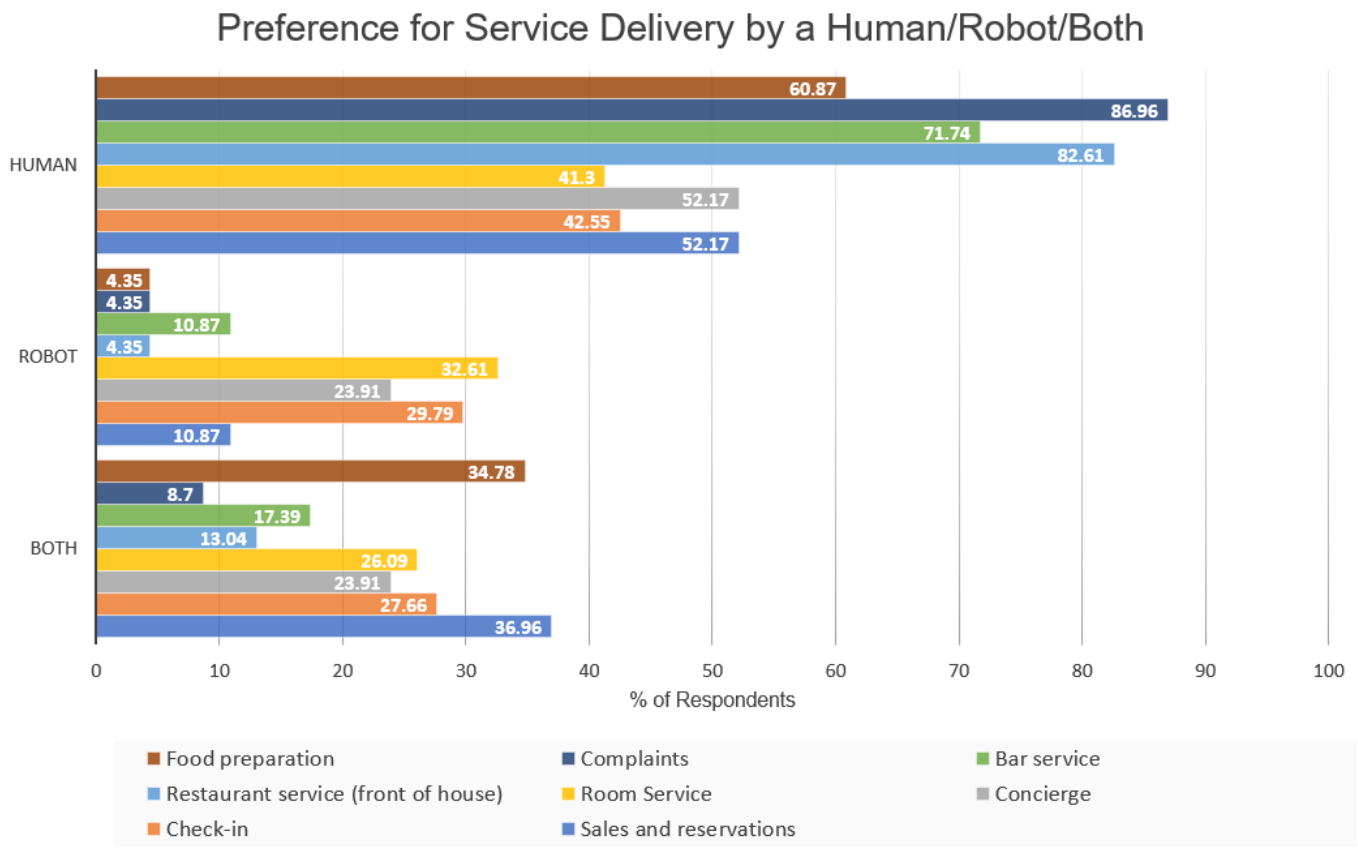
Service Preference

Figure 8 shows the areas of service within a hotel, where participants were asked to give their preference on which areas they would prefer to be delivered by a human, robot or both. 86.96% of respondents preferred to have complaints handled by human staff which supports the research by Ivanov, Seyitoğlu and Markova (2020), who exclude complaint handling as a task suitable for robotisation, instead suggesting more suitable tasks such as cleaning and processing documents.

There was in fact no significant area of preference for robot service over human service, however participants seemed more open to a dual approach, with 34.78% responding they would be happy for both humans and robots to handle food preparation, and 36.96% for sales and reservations. This suggests an acceptance of robots in back-of-house or non-emotional roles which challenges research by Hollebeek et al. (2021), who suggest a higher quality

service experience from robot-human interaction, however, supports Chan and Tung (2019) who found a higher level of consumer preference towards emotional interaction from human employees. Shin and Jeong (2020) claim less interactive robots result in a lower service quality perception from consumers, however in this case, data suggests less interaction would increase service quality perception.

Figure 8



Future of Hotel Service Delivery

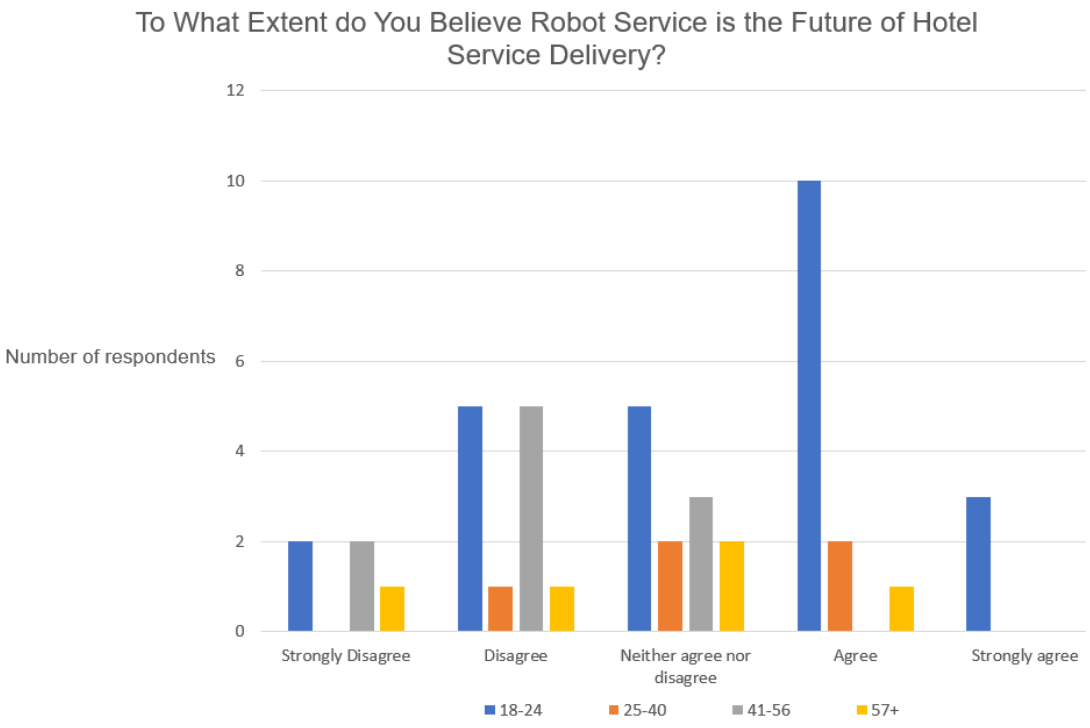
Figure 9 shows participant's responses when asked to what extent they believe robot service is the future of hotel service delivery. A total of 34% of participants chose 'Agree'/'Strongly agree', with 36% choosing 'Disagree'/'Strongly disagree'. Of the respondents who chose an agree option, 81.25% were aged 18-24, 61% of which had achieved university level

education, with another 30.8% having achieved college/6th form level education. Of the respondents who chose a disagree option, 41% were aged 41-56, with 28.6% of this category having achieved university education, and 57% having achieved college/6th form education.

Henn na hotel fired over 50% of their 243 robots as a result of negative consumer experiences and workload of employees (Ivanov et al., 2020). This would suggest that the future of hotel service delivery would not involve robot service due to their negative impacts on consumer experiences. The data in Figure 9 presents a divided population, with an almost equal number of respondents seeing robot service as the future of hospitality as those who do not.

In summary, key findings highlighted a high level of reluctance to pay more to stay at a hotel that offers robot service, suggesting a low consumer perception of value. In addition to this, the study found a preference for a dual approach of both human and robot service delivery, with data also showing robot service would not increase the engagement of consumers in their service experience.

Figure 9



CONCLUSIONS

Ivanov et al. (2020) states the advantageous qualities of service robots will catalyse their integration in the hospitality industry, however the data from this research suggests a low acceptance of robot service. For example, most survey participants stated they would not be willing to stay at a hotel which only offered robot service and no human service. In addition to a strong percentage of participants who said they would be attracted to a hotel that offered robot service; a larger percentage revealed they did not think it added any value to a hotel.

Understanding how consumers interact with hotel service robots will assist in future design and application in industry (Tussyadiah, Zach & Wang, 2020). The findings from this research suggest a higher acceptance of a dual approach where service is delivered by humans with the support of robots for non-emotional roles e.g., sales. This approach is supported by Wilson and Daugherty (2018) who report a significant improvement on business performance from human and robot collaboration. The implication of this dual approach is a potential lack of social contact and brand connection (Chan & Tung, 2019), and a risk to employees' job security as the presence of robot service can be percieved as a job threat (Kim, Kim, Badu-Baiden, Giroux & Choi, 2021).

The collected data presents a positive correlation to the research by Tussyadiah et al. (2020) who suggested anthropomorphism as the inhibiting factor for increasing consumer acceptance. This correlation is presented by the survey responses showing an unwillingness to accept robots in emotional service – a service area generally handled by humans, such as complaints. The collected data, including 50% of respondents who disagree that robots would increase their engagement, presents conflict with Mende et al. (2018) who found engagement was encouraged by anthropomorphic qualities.

Robot service appears to be incompatible with Bitner's (1992) Servicescape model in terms of space/function, particularly when considering Henna hotel's recent troubles with service robots travelling around the hotel, unable to reach all guests due to a complicated layout. Despite robots' ability to perform tasks to meet consumer requests (Tung & Law, 2017), the success of robot service integration relies on consumer perception and acceptance of robots. In summary, consumers' perceptions of service are challenged by the integration of robot

service; with its inventive uses and increased operational efficiency, it creates the prospect of a very different future for the hotel service industry.

Recommendations for Industry

This research project has influenced the formation of recommendations for the hospitality industry regarding robot service. Firstly, the integration of robots to service operations should be complimentary to human service, not substitutionary, operating a dual approach to service interaction to increase acceptance from consumers. Secondly, service robots should be utilised in non-emotional roles, for example, in food production or check-in service; this research has shown a low acceptance of robots in emotional roles, such as handling complaints. Finally, companies within the hospitality industry must consider the space/function of their respective businesses in relation to movement efficiency of service robots prior to integration; this will ensure efficiency of operations, in turn increasing service quality and consumer experience.

Limitations of Data Collection Method

Simmonds, Jarvis, Henrys, Isaac and O'Hara (2020) report small sample sizes create an inability to draw conclusions. When generalising global opinions, the 47 participant's responses in this study would not hold significant value as this sample would not be representative of a global population.

Another limitation included the lack of open-ended questions which creates an inability to expand on answers to present perspectives, affecting the validity and reliability of the collected data (Trueman, 2015). This is because the multiple-choice options may not have contained a response reflecting the participant's views (Marshall, 2005).

Additionally, time was another limitation given that there was only 2 weeks allocated for data collection. Supporting this, Wordvice (2021) explores how time constraints negatively impact result due to limited data collection. In future research, this study would be conducted with a larger allotted research time to allow sufficient responses which would enable the researcher to make assumptions on the general population.

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022001071122031127098041043075040107066105071081092072104081058082000065095027127119016114008124026117076024027006007116067104010093019094123007&EXT=pdf&INDEX=TRUE

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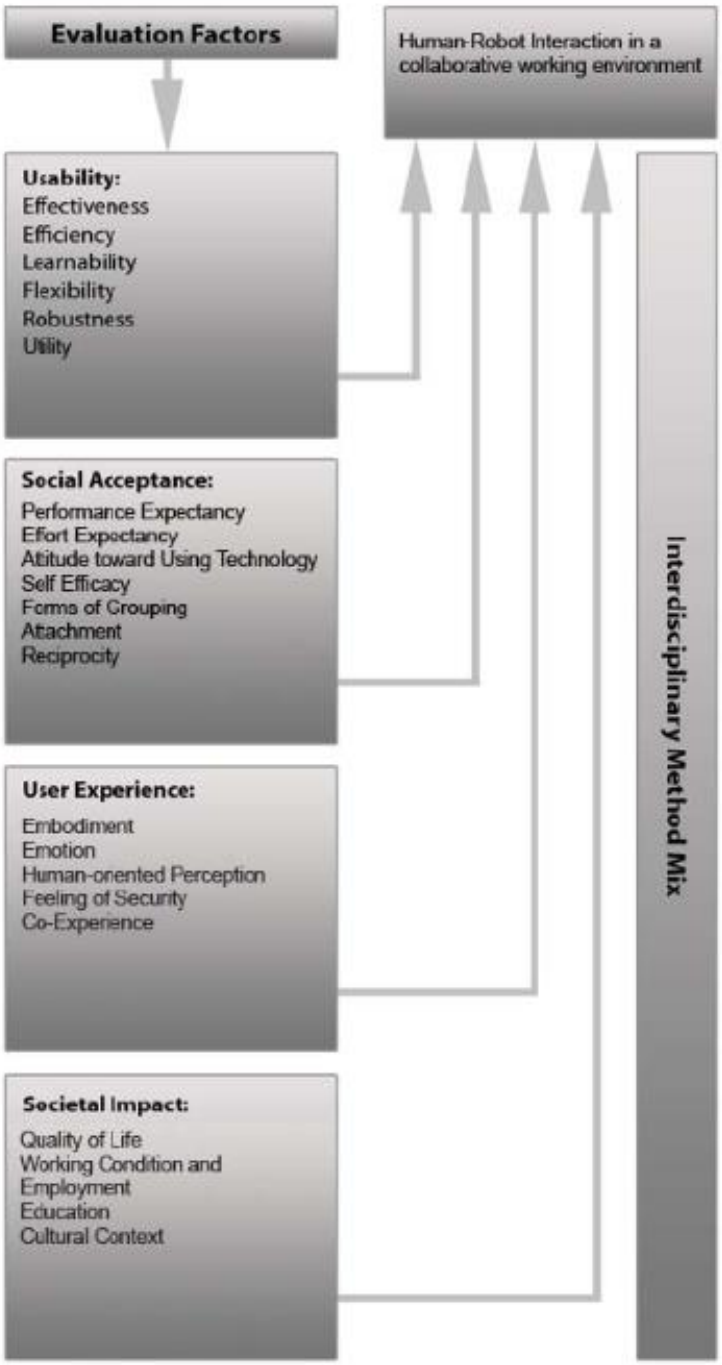
APPENDICES

Appendix 1 – Robot Evaluation Framework



Appendix 2 – Questionnaire

Research Project Survey

Start of Block: Default Question Block

Q1 The purpose of this research is to investigate how robot service impacts service delivery and consumer experience. Your participation in this study will assist in providing knowledge through personal views and experiences to the hotel industry on the proposed research topic, assisting with future industry operational decisions. Data from your experiences can be used to support the hospitality industry in recovering from the Covid-19 pandemic, and the hotel industry on developing new service designs.

It is entirely your decision whether you choose to take part in this study. You must be 18 years or older to participate. If you choose to participate, you will be required to discuss your views and experiences with robot service in hospitality. You have the right to withdraw at any time without providing a reason, and you can choose not to answer a particular question.

This one-time questionnaire should take between 5-10 minutes to complete. Responses are anonymous and any recorded data will be kept confidential, stored securely, and used solely for the purpose of the proposed research. Upon completion of the research, which is due to end March 2022, all recorded data will be destroyed/deleted. Anonymised data may also be used for conference presentations or journal papers.

On completion of research, participants, should they wish, can be emailed a summary of the results. If you would like to receive this summary, please contact the researcher on the provided email: b9001428@my.shu.ac.uk

- ○ I DO consent (1)
- ○ I do NOT consent (2)

Skip To: End of Survey If The purpose of this research is to investigate how robot service impacts service delivery and con... = I do NOT consent

Q2 Please state your age

- ○ < 18 (1)
- ○ 18-24 (2)
- ○ 25-40 (3)
- ○ 41-56 (4)
- ○ 57+ (5)

Skip To: End of Survey If Please state your age = < 18

Q3 What is the highest level of education you have achieved?

- ○ High School (1)
- ○ College/6th form (2)
- ○ University (3)
- ○ Other (4) _____

Q4 Have you ever had a robot service experience in a hotel?

- ○ Yes (1)
- ○ No (2)

Q5 To what extent do you agree with the following statements?

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)
"I would be attracted to a hotel that provided robot service" (1)	○	○	○	○	○
"Robot service increases the value of a hotel" (2)	○	○	○	○	○
"I would be willing to pay more to stay at a hotel that offers robotic service" (3)	○	○	○	○	○
"I am willing to stay at a hotel that only offers robotic service (no human service)" (4)	○	○	○	○	○
"Robot service would increase my engagement in my service experience" (5)	○	○	○	○	○

Q6 Please indicate which areas of the service experience you would prefer to be delivered by a human/robot/both.

	Human (1)	Robot (2)	Both (3)
Sales and reservations (1)	○	○	○
Check-in (2)	○	○	○
Concierge (3)	○	○	○
Room service (4)	○	○	○
Restaurant service (front of house) (5)	○	○	○
Bar service (6)	○	○	○
Complaints (7)	○	○	○
Food preparation (robots preparing your meals at the hotel) (8)	○	○	○

Q7 To what extent do you agree that robot service is the future of hotel service delivery?

- ○ Strongly agree (1)
- ○ Agree (2)
- ○ Neither agree nor disagree (3)
- ○ Disagree (4)
- ○ Strongly disagree (5)

Q8 If you wish to receive a copy of the results, please provide your email address in the box below

_____

End of Block: Default Question Block

Appendix 3 – Ethical Considerations

Ethics is the practice of reflection on which behaviour or actions may be justified, resulting in the formation of rules or principles that ensure ethical practice (Bos, 2020). Research must include an ethical consideration vantage point which allows the researcher to ensure respondents feel confident in participating; this is explored by Sfetcu (2019) who states ethical consideration ensures confidence and fairness in research (Sfetcu, 2019).

Codes of conduct must also be considered which refers to the rules and principles a researcher should hold for their own practice. Bos (2020) explores codes of conduct within research which researchers should adhere to, including objectivity, the practice of remaining impartial to avoid bias. This can be achieved by avoiding leading questions in research which can affect the responses from participants and therefore, the validity of the data.

Researchers should ensure anonymity within surveys to adhere to and abide by the revised Data Protection Act 2018 which ensures researchers follow data protection principles such as ensuring data is used for specified, explicit purposes (Gov.uk, n.d.) The validity of research is dependent on accurate data (Adinoff, Conley, Taylor & Chezem, 2013). Anonymity of a survey can encourage honesty in responses, improving the reliability and validity of the resulting data.

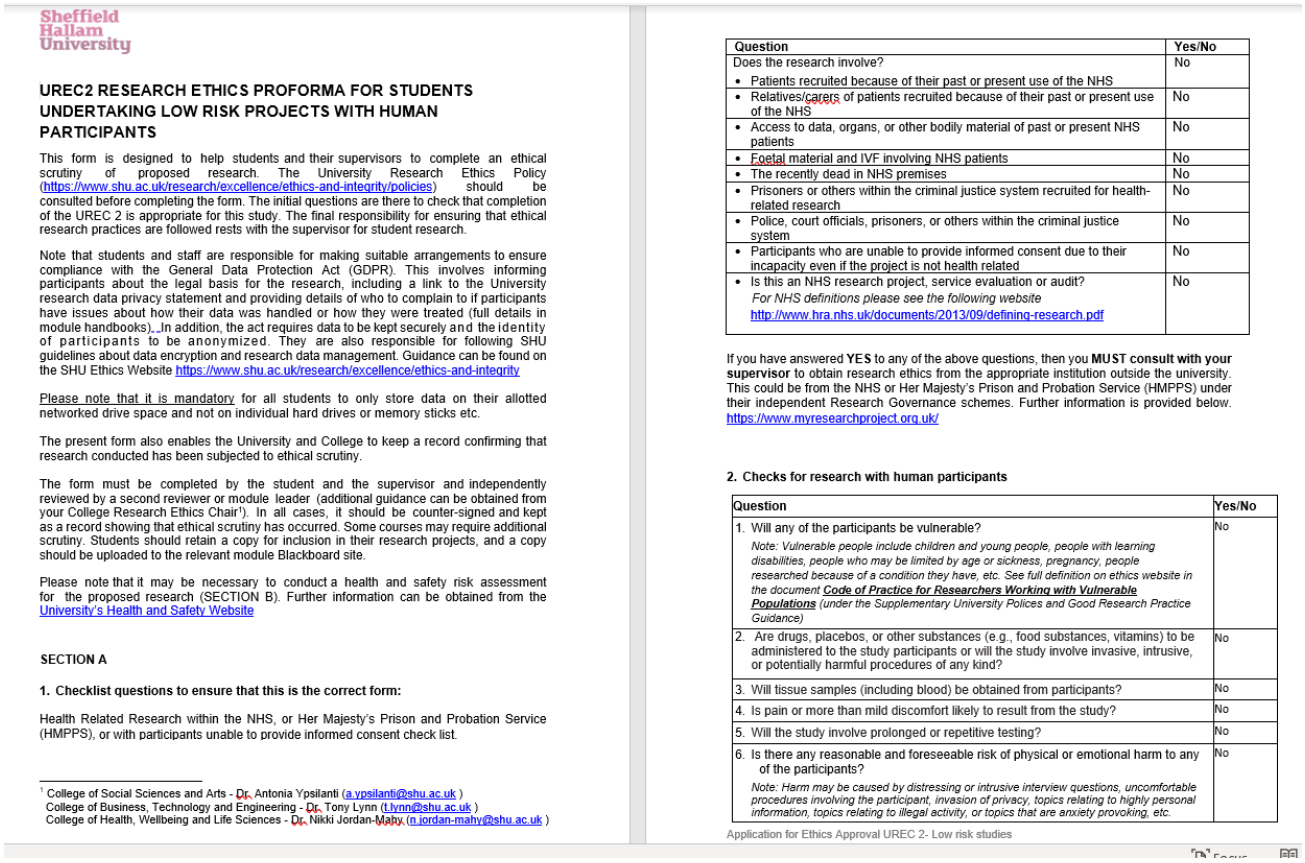
Confidentiality and anonymity have been achieved by utilising an anonymous survey response platform Qualtrics. The use of an anonymous response platform also reduces the risk of social desirability bias. This refers to the risk of a participant responding in a way they deem socially acceptable, which is not reflective of their personal reality (Bergen & Labonté, 2019).

Autonomy should be encouraged with researchers ensuring participants have a clear understanding that the survey is voluntary and have been made aware of their ability to withdraw from the survey at any time before submission (Barrow, Brannan & Khandhar,

2020). This has been achieved by inserting a paragraph of information before the survey begins, explaining to participants how their data will be used, assuring them their responses are anonymous and confidential and they have the right to withdraw at any point before the submission of their responses.

In this research, participants were given a consent option before the survey began. Accompanied with a briefing of how the information would be used and stored, participants had the option to give their informed consent to participate. This ensures the researcher remains GDPR compliant.

Appendix 4 – Ethics Form



Sheffield Hallam University

UREC2 RESEARCH ETHICS PROFORMA FOR STUDENTS UNDERTAKING LOW RISK PROJECTS WITH HUMAN PARTICIPANTS

This form is designed to help students and their supervisors to complete an ethical scrutiny of proposed research. The University Research Ethics Policy (https://www.shu.ac.uk/research/excellence/ethics-and-integrity/policies) should be consulted before completing the form. The initial questions are there to check that completion of the UREC 2 is appropriate for this study. The final responsibility for ensuring that ethical research practices are followed rests with the supervisor for student research.

Note that students and staff are responsible for making suitable arrangements to ensure compliance with the General Data Protection Act (GDPR). This involves informing participants about the legal basis for the research, including a link to the University research data privacy statement and providing details of who to complain to if participants have issues about how their data was handled or how they were treated (full details in module handbooks). In addition, the act requires data to be kept securely and the identity of participants to be anonymized. They are also responsible for following SHU guidelines about data encryption and research data management. Guidance can be found on the SHU Ethics Website https://www.shu.ac.uk/research/excellence/ethics-and-integrity

Please note that it is mandatory for all students to only store data on their allotted networked drive space and not on individual hard drives or memory sticks etc.

The present form also enables the University and College to keep a record confirming that research conducted has been subjected to ethical scrutiny.

The form must be completed by the student and the supervisor and independently reviewed by a second reviewer or module leader (additional guidance can be obtained from your College Research Ethics Chair[1]). In all cases, it should be counter-signed and kept as a record showing that ethical scrutiny has occurred. Some courses may require additional scrutiny. Students should retain a copy for inclusion in their research projects, and a copy should be uploaded to the relevant module Blackboard site.

Please note that it may be necessary to conduct a health and safety risk assessment for the proposed research (SECTION B). Further information can be obtained from the University's Health and Safety Website

SECTION A

1. Checklist questions to ensure that this is the correct form:

Health Related Research within the NHS, or Her Majesty's Prison and Probation Service (HMPPS), or with participants unable to provide informed consent check list.

[1] College of Social Sciences and Arts - Dr. Antonia Ypsilanti (a.ypsilanti@shu.ac.uk)
College of Business, Technology and Engineering - Dr. Tony Lynn (t.lynn@shu.ac.uk)
College of Health, Wellbeing and Life Sciences - Dr. Nikki Jordan-Mahy (n.jordan-mahy@shu.ac.uk)

Question	Yes/No
Does the research involve?	
• Patients recruited because of their past or present use of the NHS	No
• Relatives/carers of patients recruited because of their past or present use of the NHS	No
• Access to data, organs, or other bodily material of past or present NHS patients	No
• Foetal material and IVF involving NHS patients	No
• The recently dead in NHS premises	No
• Prisoners or others within the criminal justice system recruited for health-related research	No
• Police, court officials, prisoners, or others within the criminal justice system	No
• Participants who are unable to provide informed consent due to their incapacity even if the project is not health related	No
• Is this an NHS research project, service evaluation or audit? *For NHS definitions please see the following website* http://www.hra.nhs.uk/documents/2013/09/defining-research.pdf	No

If you have answered **YES** to any of the above questions, then you **MUST consult with your supervisor** to obtain research ethics from the appropriate institution outside the university. This could be from the NHS or Her Majesty's Prison and Probation Service (HMPPS) under their independent Research Governance schemes. Further information is provided below. https://www.myresearchproject.org.uk/

2. Checks for research with human participants

Question	Yes/No
1. Will any of the participants be vulnerable? *Note: Vulnerable people include children and young people, people with learning disabilities, people who may be limited by age or sickness, pregnancy, people researched because of a condition they have, etc. See full definition on ethics website in the document* ***Code of Practice for Researchers Working with Vulnerable Populations*** *(under the Supplementary University Polices and Good Research Practice Guidance)*	No
2. Are drugs, placebos, or other substances (e.g., food substances, vitamins) to be administered to the study participants or will the study involve invasive, intrusive, or potentially harmful procedures of any kind?	No
3. Will tissue samples (including blood) be obtained from participants?	No
4. Is pain or more than mild discomfort likely to result from the study?	No
5. Will the study involve prolonged or repetitive testing?	No
6. Is there any reasonable and foreseeable risk of physical or emotional harm to any of the participants? *Note: Harm may be caused by distressing or intrusive interview questions, uncomfortable procedures involving the participant, invasion of privacy, topics relating to highly personal information, topics relating to illegal activity, or topics that are anxiety provoking, etc.*	No

Application for Ethics Approval UREC 2- Low risk studies

Question	Yes/No
7. Will anyone be taking part without giving their informed consent?	No
8. Is it covert research? *Note: 'Covert research' refers to research that is conducted without the knowledge of participants.*	No
9. Will the research output allow identification of any individual who has not given their express consent to be identified?	No

If you have answered **YES** to any of these questions you are **REQUIRED** to complete and submit a UREC3 or UREC4 form. Your supervisor will advise. If you have answered **NO** to all these questions, then proceed with this form (UREC2).

3. General project details

Details	
Name of student	Emily Newbold
SHU email address	B9001428@my.shu.ac.uk
Department/College	Sheffield Hallam Business School
Name of supervisor	Alisha Ali
Supervisor's email address	sbsaa2@exchange.shu.ac.uk
Title of proposed research	An Investigation into the Impact of Robotic Service on Service Delivery and Consumer Experience
Proposed start date	27th September 2021
Proposed end date	13th January 2022
Background to the study and the rationale (reasons) for undertaking the research (500 words)	Despite growing attention being given to robot service and its effect on the hospitality service industry, there are limited studies which give light to the effect this has on purchase intention (Zhong, Sun, Law & Zhang, 2020), service design and consumer experience from the consumer's perspective. In addition, supporting the notion of a lack of research, Lin and Mattila (2021) suggest examination of robot service value from a consumer perspective, by which Bitner's (1992) Servicescape model can be applied, allows a holistic understanding of consumer experience, shaping business strategy. The purpose of this research is to investigate how robot service impacts consumer experience, with the aim of providing industry knowledge to hoteliers with recommendations for operational decisions. (see abstract for more detail)
Aims & research question(s)	1) To critically analyse the impact of robot service delivery on

Details	
	consumer experience. 2) To undertake primary research to analyse consumer preference regarding service delivery in relation to the implementation of robotic services in hospitality businesses. 3) To evaluate value perception and consumer's level of acceptance towards robot service. 4) To provide recommendations to hoteliers regarding the effect implementing robotic service has on consumers.
Methods to be used for: 1. Recruitment of participants 2. Data collection 3. Data analysis	1. Participants will be recruited by posting the questionnaire link on LinkedIn and Facebook. Both social media platforms are useful in reaching high volumes of potential participants. Using this 2-prong approach, Facebook will provide the researcher with access to leisure travelers, and LinkedIn will provide access to business travelers, providing a richer set of data and the ability to compare business and leisure experiences in the research. 2. Data will be collected and stored on university servers in a password-encrypted folder. The anonymous questionnaire will also collect demographic data on age and if this factor affects participant's views on robotic service. 3. Data will be analysed by frequency analysis and looking for key themes.
Outline the nature of the data held, details of anonymization, storage and disposal procedures as required.	Data will be anonymous and confidential collected from online surveys, and this will be made clear in the questionnaire information before participating. Data will be downloaded from Qualtrics in the appropriate format which will then be stored on the SHU student network, the F drive. The laptop for storage, used solely by the researcher, is also password protected. All data will be deleted upon completion of the module.

4. Research in external organizations

Question	Yes/No
1. Will the research involve working with/within an external organization (e.g., school, business, charity, museum, government department, international agency, etc.)?	No
2. If you answered YES to question 1, do you have granted access to conduct the research from the external organization? *If YES, students please show evidence to your supervisor. You should retain this evidence safely.*	n/a
3. If you do not have permission for access is this because: A. you have not yet asked B. you have asked and not yet received an answer C. you have asked and been refused access. *Note: You will only be able to start the research when you have been granted access.*	n/a

5. Research with products and artefacts

Question	Yes/No
1. Will the research involve working with copyrighted documents, films, broadcasts, photographs, artworks, designs, products, programs, databases, networks, processes, existing datasets, or secure data?	No
2. If you answered YES to question 1, are the materials you intend to use in the public domain? *Notes: 'In the public domain' does not mean the same thing as 'publicly accessible'.* • *Information which is 'in the public domain' is no longer protected by copyright (i.e., copyright has either expired or been waived) and can be used without permission.* • *Information which is 'publicly accessible' (e.g., TV broadcasts, websites, artworks, newspapers) is available for anyone to consult/view. It is still protected by copyright even if there is no copyright notice. In UK law, copyright protection is automatic and does not require a copyright statement, although it is always good practice to provide one. It is necessary to check the terms and conditions of use to find out exactly how the material may be reused etc.* *If you answered YES to question 1, be aware that you may need to consider other ethics codes. For example, when conducting Internet research, consult the code of the Association of Internet Researchers; for educational research, consult the Code of Ethics of the British Educational Research Association.*	n/a
3. If you answered NO to question 2, do you have explicit permission to use these materials as data? *If YES, please show evidence to your supervisor.*	n/a

Question	Yes/No
4. If you answered NO to question 3, is it because: A. you have not yet asked permission B. you have asked and not yet received and answer C. you have asked and been refused access. *Note You will only be able to start the research when you have been granted permission to use the specified material.*	n/a

SECTION B

HEALTH AND SAFETY RISK ASSESSMENT FOR THE RESEARCHER

1. Does this research project require a health and safety risk assessment for the procedures to be used? Discuss this with your supervisor and consult the Risk Assessment Toolkit for teaching research.

☐ Yes
☑ No

(If **YES** the completed Health and Safety Risk Assessment form should be attached). You can find a Blank/Sample Risk Assessment Form at the Checklist, Generic and TORS Risk Assessments on the Risk Assessment Toolkit

2. Will the data be collected fully online (no face-to-face contact with participants)?

☑ Yes (See the safety guidance for online research[2] and **go to question 8b**).
☐ No (Go to question 3)

3. Will the proposed data collection take place on campus?

☐ Yes (Please answer questions 5 to 8)
☐ No (Please complete all questions and consult with your supervisor or HoD for current guidance and permission for face-to-face research outside the university)

4. Where will the data collection take place?
(Tick as many as apply if data collection will take place in multiple venues)

[2] Safety guidance for online research includes information on how to set up online surveys and/or conduct online interviews/focus groups. These guidelines can be found in BB. Please check with your supervisor/module leader.

Location	Please specify
☐ Researcher's Residence	
☐ Participant's Residence	
☐ Education Establishment	
☐ Other e.g., business/voluntary organisation, public venue	
☐ Outside UK	

5. **If face-to-face contact with participants is required for your study? Please stipulate below how you will comply with any government requirements related to Covid-19 and social distancing or other limitations on contact.**

6. **How will you travel to and from the data collection venue?**

☐ On foot ☐ By car ☐ Public Transport
☐ Other (Please specify)

Please outline how you will ensure your personal safety when travelling to and from the data collection venue (include any Covid-19 related precautions)

7. **How will you ensure your own personal safety whilst at the research venue?**

8. **Are there any potential risks to your health and wellbeing associated with either (a) the venue where the research will take place and/or (b) the research topic itself?**

☑ None that I am aware of
☐ Yes (Please outline below including steps taken to minimise risk)

9. **If you are carrying out research off-campus, you must ensure that each time you go out to collect data you ensure that someone you trust knows where you are going (without breaching the confidentiality of your participants), how you are getting there (preferably including your travel route), when you expect to get back, and what to do should you not return at the specified time.**

Please outline here the procedure you propose using to do this.

Adherence to SHU policy and procedures

Ethics sign-off	
Personal statement	
I can confirm that: • I have read the Sheffield Hallam University Research Ethics Policy and Procedures • I agree to abide by its principles.	
Student	
Name: Emily Newbold	Date: 20/10/21
Signature: Emily Newbold	
Supervisor or another person giving ethical sign-off	
I can confirm that completion of this form has not identified the need for ethical approval by the TPREC/CREC or an NHS, Social Care, or other external REC. The research will not commence until any approvals required under Sections 4 & 5 have been received and any necessary health and safety measures are in place.	
Name: Alisha Ali	Date: 20/10/21
Signature: Alisha Ali	
Additional Signature if required by course leader:	
Name:	Date:
Signature:	

Please ensure that you have attached all relevant documents. Your supervisor must approve them before you start data collection:

Documents	Yes	No	N/A
Research proposal if prepared previously	☑	☐	☐
Any recruitment materials (e.g., posters, letters, emails, etc.)	☐	☐	☑
Participant information sheet[3]	☑	☐	☐
Participant consent form[4]	☑	☐	☐
Details of measures to be used (e.g., questionnaires, etc.)	☑	☐	☐
Outline interview schedule / focus group schedule	☐	☐	☑
Debriefing materials	☐	☐	☑
Health and Safety Risk Assessment Form	☐	☐	☑

[3] It is mandatory to attach the Participant Information Sheet (PIS)
[4] It is mandatory to attach a Participant Consent Form, unless it is embedded in an online survey, in which case your supervisor must approve it before you start data collection