Prime Time for Service Robots

The COVID-19 pandemic catapulted the hospitality industry into a more digitised future. Coupled with the vast social changes and prominent safety concerns, this wave of technological innovation could transform the hospitality workforce, according to Seongseop (Sam) Kim of the SHTM and co-authors. Service robots could solve many of the safety concerns felt to this day, but how are they perceived by customers? To probe these issues in more depth, the researchers investigated how feelings of safety and the intention to visit an establishment are shaped by the presence of robot baristas, as well as the influence of vaccination status and mask-wearing.

New Safety Priorities

Before 2020, the hospitality industry prided itself on providing a warm welcome through close interpersonal contact between guests and service staff. After the outbreak of COVID-19, safety became the critical box to tick for hospitality managers, inevitably overriding the more "human" experiences of the past. Confronted with infection risk, customers need more reassurance than before. Contactless services, self-check-in devices and service robots have become staples of the post-COVID-19 service landscape. "Managers of numerous establishments have focused on enhancing safety, hygiene and cleanliness and alleviating public concerns", explain the authors.

As a result, customers' pre-pandemic preferences for human staff over robots have been flipped on their head. Driven more than ever by fear of infection, travellers and guests preferred contactless AI technology during the pandemic period. Research at that time found that robots were more positively viewed than human staff during COVID-19 infection rate peaks. "This suggests that the unprecedented global pandemic and long-lasting concerns about safety have substantially influenced consumer perceptions of service robots", say the researchers.

Robots could be of great value in a post-COVID-19 world, as concern about the virus remains rife among travellers. However, given the recency of both the pandemic and related technological advances, it remains unclear which features of service robots drive a preference over humans. It is critical to understand this, say the researchers, because service robots can, by decreasing health risks, increase the feeling of security and inspire "increased visiting intentions and a willingness to use and pay more". Moving forward, it will be crucial to create human–computer interactions that can offer as much as – if not more than – person-to-person service interactions.

An Infection-Free Solution

Person-to-person contact could soon begin to be replaced by "robot baristas, receptionists and concierges, together with facial scan check-ins, voice-activated guest control and other contactless services", say the researchers. Already, service robots are an emerging trend in restaurants and cafés worldwide, from San Francisco's Café X to the robot mixologist of Switzerland's F&P Robotics and Hong Kong's one-of-a-kind milk-tea silk stocking-straining robot. The continued emphasis on hygiene and cleanliness means that integrating service robots into the service environment seems the way forward.

However, there is still no thorough understanding of how human–robot interactions shape leisure experiences, or which safety-related attributes are most valued by customers. "To successfully adopt service robots in service delivery environments", explain the researchers, "it is important to understand what makes customers feel safer and how the perception of safety influences their behaviour". For this reason, they investigated whether customers would feel safer with a robot or human barista, and how this affected their intention to return.

More human-like robots reportedly drive more satisfying guest experiences. This could be particularly important given the post-pandemic norm of mask-wearing, which provides a sense of reassurance. "No empirical study has been conducted on whether the use of masks moderates how human and robot staff are perceived during the COVID-19 pandemic", say the authors. While mask-wearing by human employees could increase perceived safety, robots wearing masks might cause anxiety.

Finally, the investigators examined how customers' vaccination status fed into their assessments of safety. "There may be differences in consumers' perceived safety of masked robot baristas depending on the customer's COVID-19 vaccination status", say the authors, "because unvaccinated consumers may have a lower perception of safety regarding masked robot staff compared with fully vaccinated consumers". Customers who are not fully vaccinated were expected

to feel less safe when confronted with unmasked human staff.

Three Innovative Studies

Three successive studies investigated the preference for robots over humans and the moderating roles of mask-wearing and vaccination status. In the first study, 135 participants were presented with a theoretical scenario involving trying out a new coffee house. They were then shown one of two sets of photos. In the first set, a robot was shown preparing and serving a cup of coffee. In the second set, a human barista was shown preparing and serving an identical cup of coffee. The participants then completed a questionnaire to assess their intention to visit the coffee shop and perceived safety.

In study 2, 300 participants were shown photos of either masked or unmasked robot/human baristas, and completed the same questionnaire. An additional 300 participants were recruited to complete Study 3, which measured the additional effect of the participants' vaccination status, for which the participants indicated whether they were fully vaccinated or not.

Safety Signals or Warning Signs?

Overall, robot baristas were consistently perceived as safer than human baristas. Moreover, perceived safety was identified as a key factor explaining the preference for robot baristas over human baristas. The participants also reported being more likely to visit the café when perceived safety was highest. "When customers' attention to safety is heightened", report the researchers, "the

adoption of service robots could be a strategic way to increase customers' visit intention to restaurants".

The studies also delved into the psychological response to masks, and how this alters perceived safety in human–computer interactions. Thus, this work uniquely elucidates how human-like behaviour by robots is interpreted, and how it affects subsequent customer behaviour. "Interestingly, mask-wearing produced seemingly opposite types of heuristics (e.g. safety and risk) for human baristas and robot baristas", report the researchers. In other words, the same visual cue of a mask resulted in contradictory perceptions of safety for robot and human baristas. According to the authors, this is because masks are practical and protective when worn by humans, but a symbolic warning sign when worn by robots.

The vaccination status of customers also influenced how mask-wearing was perceived. For human baristas, vaccination status had no effect on perceived safety. For robot baristas, fully vaccinated customers tended to rely more on visual cues, and non-fully vaccinated customers tended towards interpreting the "symbolic" meaning of the mask. "Vaccinated consumers experience higher levels of perceived safety when interacting with masked robot staff than with unmasked robot staff", state the researchers. Given the increasing numbers of vaccinated customers, the use of robot staff wearing face masks could be an effective management strategy.

A Future for Service Robots

This pioneering study places itself within the context of modern-day trepidation surrounding COVID-19. The results deepen

our understanding of human–computer interaction and show that robots could well have a place in the recovering hospitality sector. With a new spotlight on safety in the hospitality industry, the use of AI, such as contactless services, is proving more popular than ever before. By deciphering the impact of vaccination status and feelings about mask-wearing on preference for service robots, the findings are ultimately expected to help businesses recover following the pandemic period, and to propel the industry into a more technologically driven future.

POINTS TO NOTE

- During a pandemic, robot baristas are perceived as safer than humans and boost visit intention.

- Mask-wearing by human hospitality staff increases perceived safety.

- Mask-wearing by service robots increases perceived safety for vaccinated but not unvaccinated customers.

- Hospitality firms need to understand perceptions of high-tech services in the post-pandemic period.

Choi, Miju, Choi, Youngjoon, Kim, Seongseop (Sam), and Badu-Baiden, Frank (2023). Human vs Robot Baristas during the COVID-19 Pandemic: Effects of Masks and Vaccines on Perceived Safety and Visit Intention. *International Journal of Contemporary Hospitality Management,* Vol. 35, Issue 2, 469-491.