

**Robotics for Customer Service: A Useful Complement or an Ultimate Substitute?**

**Executive Summary**

Enabled by recent advances in mechanical engineering and artificial intelligence (AI) technologies, customer service robots have shown great potential in many business applications such as food, accommodation, retailing, healthcare, finance, entertainment, logistics, and travel, among others. Implementing robotics has become a trend that customer service firms cannot afford to ignore, especially in light of the rising costs of human labor and the gradually enhanced capabilities but declining costs of robotics. However, successfully incorporating robotics into customer service remains a significant challenge for most firms. With the increasing prevalence of robotics in customer service, firms need urgent and actionable guidance on how, when, and to what extent to adopt and integrate robotics in their customer service operations to gain a sustainable competitive advantage.

This study proposes a conceptual framework resulting in actionable guidance for managers to adopt and integrate robotics into their customer service operations. In doing so, this study identifies the antecedents and consequences of robotics adoption, and generates insights on customer service, technology marketing, and computer science. This study indicates that both employee acceptance of robots (EAR) and customer acceptance of robots (CAR) will positively influence firms' decision on robotics adoption, and hypothesizes the positive effect of managerial support on employee acceptance of robots. Additionally, this study theoretically demonstrates the positive effects of employee/customer readiness, demographics (male over female; young over old), five innovation attributes, and the involvement and intensity of human-robot interaction on both EAR and CAR, as well as the negative effects of perceived risk and intrusion. It also proposes a quadratic effect of firm's degree of robotics adoption (DRA) on service quality, which is positive at low levels of DRA up to a threshold, and discusses how such a quadratic effect might diminish for B2B (vs. B2C) firms, hedonic (vs. utilitarian) services, and high-equity (vs. low-equity) brands.

The authors believe that robots will act as a useful complement to the human labor force in the foreseeable future. Customers can expect to be served by a part-robotic, part-human

workforce in most service encounters over the coming years. When firms make high-level robotics adoption decisions, they should take into account not only the aforementioned micro-level factors (e.g. robot characteristics, employee/customer characteristics), but also such macro-level factors as technical feasibility, labor economy, legal policy and ethical trends. The authors also suggest a three-step process for firms to seamlessly integrate robots into their customer service team.

*Step 1: Redesign service procedures.* This step requires a thorough understanding of: a) what customers really want from the service team, i.e. the goals that the service team aims to achieve; b) all possible interactions that customers might have with the service team; c) the respective capacities of robot and human employees, especially their strengths and weaknesses at each service encounter; and d) customers' acceptance of adopting robotics at each service encounter.

*Step 2: Restructure the service team.* This step focuses on hiring the right robot and human employees. The right service robots need to ensure not only proper functioning in various service encounters, but also socially acceptable, preferably endearing, appearances. The right human employees need to be delighted to work and collaborate with robots, and be technically competent and creative in solving complex service problems that robots cannot solve.

*Step 3: Provide supporting functions.* This step includes, but is not limited to, comprehensive training for both service robots and employees, a (re)designing-implementation-evaluation loop on service performance, regular maintenance, and updating with hardware and software on robots.