

The Robot and I: The Rise of Hybrid Service Teams

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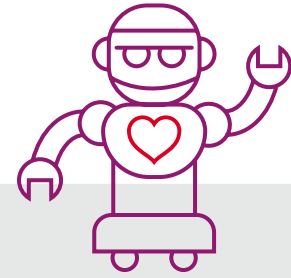
The service revolution has started ✕ Our economies seem to be facing a turning point in the service sector. Technologies are rapidly becoming smarter and more powerful, and at the same time, they are getting smaller, lighter and cheaper. These include hardware, such as physical robots, drones and wearable technologies, and code and software such as for analytics, speech processing, image processing, virtual and augmented reality, cloud technologies, mobile technologies, geotagging, robotic process automation (RPA), low-code platforms and machine learning. Together, these technologies will transform virtually all service sectors. Combined with these technologies, service robots and artificial intelligence (AI) will lead to rapid innovation that can dramatically improve the customer experience, service quality and productivity all at the same time.

The incremental costs of robots are close to zero

✕ Robot- and AI-delivered service offers unprecedented economies of scale and scope, as the bulk of the costs are incurred in their development. Physical robots cost a fraction of adding headcount, and virtual robots scale at close to zero incremental costs. Such dramatic scalability applies to chatbots and “visible” robots such as holograms. For example, an airport could install a hologram-based humanoid service robot every 50 meters to assist passengers and deal with common questions like arrival information and directions to check-in counters in all common languages. These holograms only require low-cost hardware like a camera, microphone, speaker and projector and do not need to take up floor space: Travelers could even push their baggage carts through a hologram when it gets crowded.

Different qualities of service robots and human frontline employees

✕ As the relative strengths of humans and robotic services differ, they are best deployed in different contexts (see Figure 1). It is difficult for robots to deal with



BOX 1

Existing applications of service robots



- > **Hotels** introduce humanoid robots in their lobbies where they welcome guests, provide information and entertain guests. Connie, for instance, is the robot concierge used in some Hilton hotels. The robot was developed by IBM using their Watson AI platform and can interact with guests and respond to their questions. Connie has speech recognition capabilities and learns and adapts with each interaction, improving its answers.

The EMC2 hotel in Chicago lists their robotic attendants Leo and Cleo among the hotel's amenities. Waist-high and dressed with coattails, they can fulfill guests' diverse needs by delivering an extra towel, a snack, a toothbrush and more.



- > At **airports**, robots are used to scan boarding passes and help passengers find the right departure gate. Self-moving check-in kiosk robots detect busy areas and autonomously help passengers reduce waiting time. Kansai airport in Japan uses two security robots that autonomously navigate and patrol routes to detect any security breaches and give an alert. They use laser sensors to move around and capture images with built-in cameras.



- > **COVID-19** has increased the demand for medical service robots that check peoples' temperature and take over disinfection work. Some Japanese airports have deployed robotic PCR testing systems to assist with the COVID-19 protocol. Systems were able to complete rapid testing within 80 minutes and process up to 2,500 passenger samples in 16 hours. The use of robots decreased infection risk around the airports and reduced contact between passengers and security personnel.



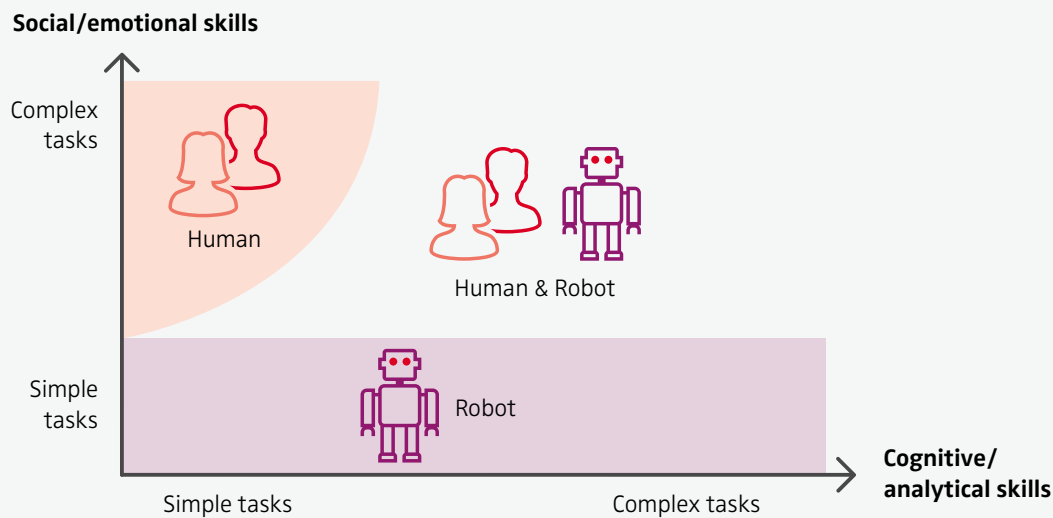
- > At the **Winter Olympics** in Beijing, a fully automated canteen cared for the athletes and staff. Meals were prepared by robot cooks and then fully automatically steered to the guests' tables, where drones airdropped them. Even the bartender mixing drinks was a robot.

emotions that go beyond a pleasant display of surface demeanor. Especially complex and emotionally demanding tasks are still better handled by service employees, as they can bring genuine emotions such as excitement and joy or empathy and compassion to the service encounter. For example, humans can respond better to the individual context and show understanding in complaint and service recovery situations.

On the other hand, service robots can deliver services effectively that require high cognitive and analytical skills, such as in financial services settings. For example, service robots can analyze large volumes of data, integrate internal and external information, recognize patterns and relate these to customer profiles. Within minutes, these robots can propose best-fitting solutions and make recommendations. Figure 1 shows how humans and robots are best deployed in service settings.

The charm of hybrid service teams ✕ Human-robot teams will increasingly deliver tasks requiring high cognitive and emotional skills. Text and voice-based conversational agents increasingly handle routine customer interactions. Even when interacting with a human service employee, AI may support that employee. When calls become complex, they are prescreened, preprocessed and escalated to a human agent. The outcome is that customer contact staff do not have to deal with high volumes of trivial customer requests but instead spend their time on higher-value and higher-level tasks. For example, a chatbot for the NUS MBA Program handled 20,000 unique conversations per month right after launch and answered routine questions like "Do I need a GMAT?," "What scholarships are available?" or "When is the application deadline?" The admission team can now focus on top-quality candidates and on more tricky and complex discussions.

FIGURE 1 > The service robot deployment model



(adapted from Wirtz et al., 2018)

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As the relative strengths of humans and robotic services differ, they are best deployed in different contexts.












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In a healthcare context, for example, service robots will do the analytical work like analyzing symptoms and comparing them with databases to identify possible diagnoses, and humans will make the final recommendations and decisions and take over the social and emotional tasks like advising and persuading patients. For example, the first author's daughter returned from Singapore to Munich with dengue fever; the symptoms only showed a week after her return. General practitioners in Germany may never see a dengue fever patient in their professional life and may not be effective in diagnosing it. On the other hand, a service robot can easily compare patient data and symptoms and provide a "hit list" of possible diseases with a fit index. The general practitioners can then work down the list and discuss it with the patient to identify the most likely diagnosis and test for it. In our case, they would check if the patient had been in the tropics during the past few weeks. Figure 2 gives an

overview of the different qualities of humans vs. robots in service settings and how companies can combine them to gain competitive advantages.

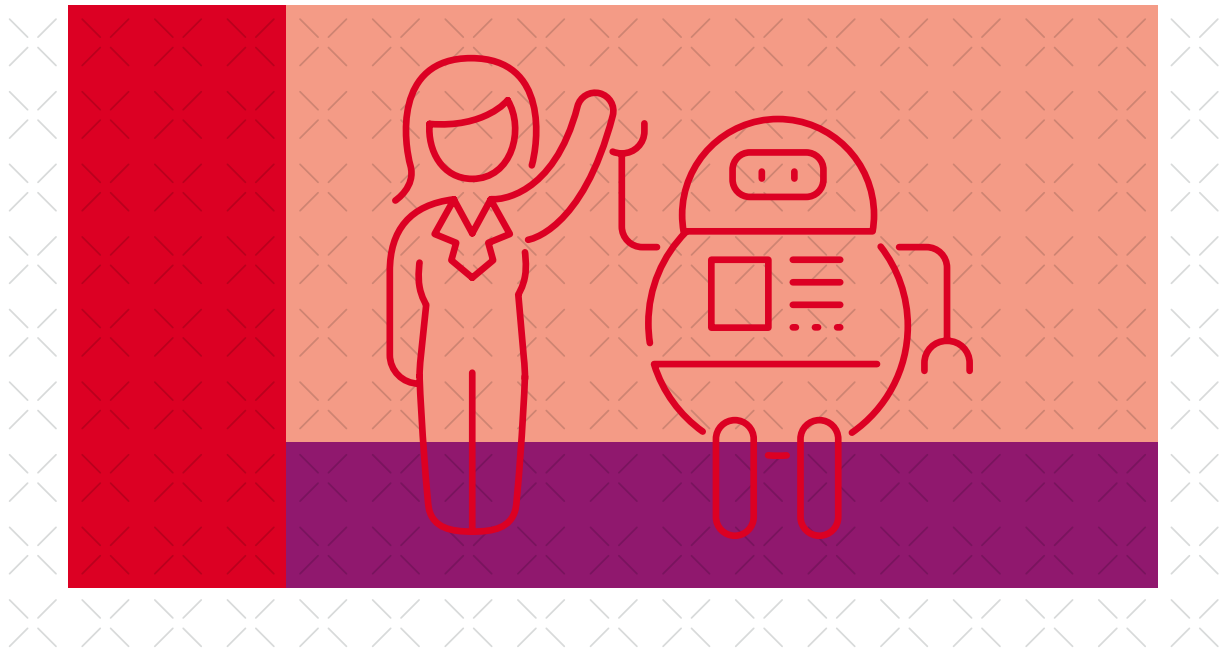
Implications for service companies ✕ We predict that hybrid human-robot teams and collaboration will be the future service model for many more complex service contexts. These hybrid teams will realize productivity and service quality gains for the company by combining the advantages of AI and human employees. Robots' enormous knowledge and data are undeniable advantages for creating customized services. Organizations should focus on implementing, managing and fine-tuning the deployment of robot-employee-customer co-creation teams to ensure and constantly increase the quality of their customer interactions. The following recommendations refer to the most pressing topics for service companies to tackle.

FIGURE 2 > Developing a competitive edge by combining the advantages of AI and human employees

	Service Employees		Service Robots	
	<ul style="list-style-type: none"> > Act as individuals, individual learning > Need training > Limited memory and access 	Training and Learning	<ul style="list-style-type: none"> > Act as part of systems, are connected, system learning > Upgradable, system-wide > Virtually endless memory and access 	
				<ul style="list-style-type: none"> > High incremental cost > Low economies of scale and scope
	<ul style="list-style-type: none"> > Heterogeneous output > Customization and personalization depend on employee skill and effort > Unintended biases > Have genuine emotions > Can engage in out-of-box thinking and creative problem solving 	Customer Experience	<ul style="list-style-type: none"> > Homogenous output > Customization and personalization can be delivered on scale at consistent quality and performance > Potentially no biases > Can mimic emotions > Limited out-of-box thinking, have rule-bound limits 	
				<ul style="list-style-type: none"> > Service employees can be a source of competitive advantage > Differentiation on service can be based on better hiring, selection, training, motivation, and organization of service employees
	Hybrid service teams can leverage economies of scale and differentiation opportunities of humans to create unique, faster and more convenient service experiences.			
				
				

> **Restructure the service frontline** ✕ When implementing service robots, companies will inevitably transform and dramatically reorganize. This reorganization requires strong leadership and support, and employees' willingness and ability to change. Employees will be assigned to new tasks and responsibilities and need to develop skills like RPA, basic programming and technology troubleshooting.

> **Consider service robots as a necessary investment** ✕ The deployment of service robots comes with investments, including acquisition, integration, development and maintenance costs, development of necessary IT and AI specialists and programmers and building virtual networks and maintenance of systems. It may take time for these investments to be recouped. According to our experience,



rience, however, often less than 12 months are required for payback of projects in successful implementations.

- > **Mitigate potential risks of robot deployment** ✕ Organizations need to mitigate potential anxieties related to customer-facing service robots such as algorithm aversion, perceived loss of the human touch and consumer privacy. That mitigation requires that organizations embrace corporate digital responsibility (CDR) and develop a set of shared values, norms and actionable guidelines on the responsible use of technology and associated data, such as regarding how data is to be captured, used and retired and how data-related decisions are reached. Specific decisions that managers need to make include whether, for instance, biometrics or data from social media accounts will be collected, whether variables will be used to build indices or financial scores to support decision-making, such as for approving loans and setting interest rates and when the information will be deleted from the company's database, e.g., on a bounced payment.

AI offers great opportunities for cost-effective service excellence ✕ In summary, service robots and AI will transform the service sector and bring unprecedented improvements to the customer experience, service quality and productivity all at the same time. As such, this service revolution has the potential to increase our standard of living as much as the

industrial revolution did by improving manufactured goods. This time, however, it is financial, logistics, healthcare and education services that are being radically transformed. ✕



FURTHER READING

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