

Be Prepared for the Service Revolution

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Society is on the cusp of a service revolution. Again, we have the opportunity to rapidly increase our standard of living, but this time by industrialising the service sector.

Boards need to ensure the companies they serve are future-ready and can translate the vast opportunities that are opening up. The global economy is facing a turning point similar to the industrial revolution that started in the late 18th century that brought high quality, low cost manufactured goods to the masses.

Now it's the turn of the services industry.

Technologies have rapidly become smarter and more powerful, while at the same time, they have become smaller, lighter and cheaper. These technologies include hardware such as sensors, cameras, wearable technologies, physical robots and drones; and code or software such as image processing, speech processing, analytics, mobile and cloud technologies, geo-tagging, biometrics, virtual reality, augmented reality, machine learning and much more.

Service robots and artificial intelligence

Together, these technologies will transform virtually all service sectors. Service robots and artificial intelligence (AI), in combination with these technologies, will lead to rapid innovation. This will dramatically improve the customer experience, service quality and productivity all at the same time. This revolution offers vast opportunities for the ready firm but will also lead to further concentration of entire industries whereby many firms will go under.

Robotic and AI-delivered service is likely to show 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 can be deployed at negligible incremental costs. In particular, virtual service robots (e.g., chatbots and virtual agents) can be scaled at close to zero incremental costs. Such dramatic scalability does not only apply to virtual service robots but also to visible ones such as holograms.

For example, an airport could instal a hologram-based humanoid service robot every 50 metres to assist passengers and deal with common questions (e.g., give directions to the check-in for a particular airline, the nearest toilet, the airport hotel, and provide arrival and departure information) in all common languages. These holograms only require low-cost hardware (i.e., a camera, microphone, speaker, and hologram projector) and do not need to take up floor space (travellers could push their baggage carts through a hologram).

Robot-staffed hotels and restaurants and drone delivery are only the beginning of this revolution. Similar to the shift that started in the industrial revolution (from craftsmen to mass production), an accelerated shift in the service sector towards robotic and AI-delivered services is about to occur.

The exciting prospect is that many services, including healthcare and education, are likely to be available at much lower prices and lead to a dramatic quality improvement. We are entering an exciting area with a growing need for firms that can design and deliver these services of the future.

What's the difference?

Service robots have been defined as “system-based autonomous and adaptable interfaces that interact, communicate and deliver service to an organisation’s customers”. These abilities differentiate service robots from traditional self-service technologies (SSTs).

Service robots can conduct unstructured interactions with customers and guide them through the process. For example, a service robot-

powered ticketing machine will guide customers when buying a ticket, ask clarifying questions (e.g., “Is your return trip today? Do you have a concession card? Can you travel off-peak?”), and can even correct customer errors (e.g., wrong information entered by a customer).

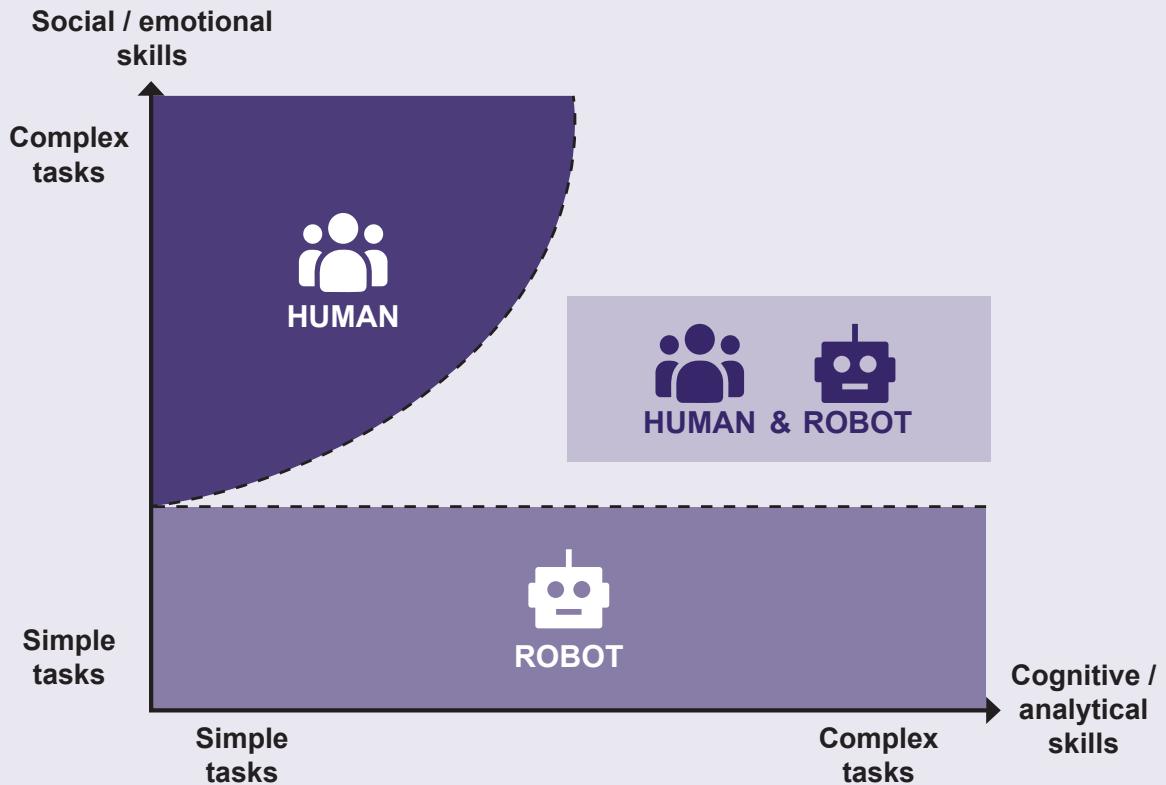
In fact, for many standard services, customers will be able to interact with service robots much like with service employees (e.g., “I need a same-day return ticket and want to pay with this credit

Comparison of Traditional SSTs with Service Robots

Service Aspect	Self-Service Technologies (SSTs)	Service Robots
Customer Service Scripts and Roles	<ul style="list-style-type: none"> Customers have to learn the service script and role, and follow it closely. 	<ul style="list-style-type: none"> Customers do not need to learn a particular role and script beyond what they would do when interacting with a frontline employee.
	<ul style="list-style-type: none"> Deviations from the script tend to lead to service failure and unsuccessful transactions. 	<ul style="list-style-type: none"> Flexible interaction and scripts are supported.
	<ul style="list-style-type: none"> Need to be self-explanatory and intuitive as customers have to control and navigate the interaction. 	<ul style="list-style-type: none"> Can guide the customer through the service process very much like a service employee would.
Customer Error Tolerance	<ul style="list-style-type: none"> Generally do not function when customers make errors or use the SST incorrectly. 	<ul style="list-style-type: none"> Are customer error tolerant.
	<ul style="list-style-type: none"> Generally are not effective in recovering customer errors. 	<ul style="list-style-type: none"> Can recover customer errors and guide the customer to conclude a successful service transaction.
Service Recovery to Other Service Failures	<ul style="list-style-type: none"> The service process tends to break down when there is a service failure; recovery is unlikely within the technology. 	<ul style="list-style-type: none"> Can recover the service by offering alternative solutions very much like a service employee would.

Adapted from: Jochen Wirtz, Paul Patterson, Werner Kunz, Thorsten Gruber, Vinh Nhat Lu, Stefanie Paluch, and Antje Martins (2018), “Brave New World: Service Robots in the Frontline”, *Journal of Service Management*, Vol. 29, No. 5, 907-931.

The Service Robot Deployment Model



Source: Jochen Wirtz, Paul Patterson, Werner Kunz, Thorsten Gruber, Vinh Nhat Lu, Stefanie Paluch, and Antje Martins (2018), "Brave New World: Service Robots in the Frontline", *Journal of Service Management*, Vol 29, No. 5, 907-931.

card"). See box, "Comparison of Traditional SSTs with Service Robots".

Service robots in the frontline

The initial deployments of service robots focused on simple and repetitive tasks that tend to be low in terms of their cognitive and emotional complexity (see box, "The Service Robot Deployment Model"). For example, physical robots in hotels can deliver room service and bring baggage to guest rooms.

Text and voice-based conversational agents increasingly handle routine customer interactions. Calls can be pre-screened and routed either to a conversational agent or to a human, depending on the complexity of the issue. Even when interacting with a human service employee, that employee may well be supported by AI.

The outcome is that customer contact staff do not have to deal with high volumes of trivial customer requests but instead can spend their time on higher-value and higher-level tasks.

In addition to routine tasks, services that require high cognitive and analytical skills, such as in accounting and stock trading, can be delivered effectively by service robots. For example, service robots can be designed to analyse large volumes of data, integrate internal and external information, recognise patterns, and relate these to customer profiles. Within minutes, these robots can propose best-fitting solutions and make recommendations. See box, "Case 1: USSA uses IBM Watson to deliver financial services".

It is difficult for robots when they have to deal with emotions that go beyond a pleasant display

Case 1**USAA uses IBM Watson to deliver financial services**

USAA is a financial services provider for the military community and is renowned for its service excellence, high productivity (its expense ratio is almost half the industry average), and extensive use of technology. It adopts service robots and collaborates with IBM, using its Watson Engagement Advisor.

One of its applications helps military members to transition from the military to civilian life. This application started with the IBM Watson identifying, analysing, and understanding a database derived from more than 3,000 USAA documents related to topics on military transitions. Today, customers can visit USAA's website to ask questions related to leaving the

Source: Ming-Hui Huang and Roland Rust, "Engaged to a Robot? The Role of AI in Service", *Journal of Service Research* 2020 (published online first); USAA and IBM Join Forces to Service Military Members (IBM, 2014).

of surface demeanour. Especially complex and emotionally demanding tasks are still better handled by service employees as they can bring true emotions such as empathy and compassion to the service encounter. For example, in complaint and service recovery situations, humans can respond better to the individual context and show understanding.

Tasks that require high cognitive and high emotional skills will increasingly be delivered by human-robot teams. Service robots will deliver analytical work (e.g., analyse symptoms and compare them with databases to identify possible diagnoses), and humans will take over the social and emotional tasks (e.g., advising and persuading patients) and make the final recommendations and decisions.

A different user experience

Finally, we used the term "service robot" to loosely refer to all the technologies involved in intelligently automating services. Of course,



military, such as military benefits, job search and home purchase.

Importantly, the AI provides personalised advice based on a member's characteristics and specific situation. The service can even counsel members as the transition into civilian life can be stressful and uncertain (members often do not know how to start the daunting process). This service scales up by adding new information and learning from new questions, enabling USAA to deliver exceptional customised service for its members.

many different technologies are involved. Various technologies can be integrated to deliver a fully automated and scaleable process. See box, "Case 2: Using intelligent automation to transform a bank's customer experience".

Automating end-to-end processes is not an easy task as it combines a wide range of capabilities. Unfortunately, there is no one single technology that currently can master all these capabilities. Therefore, the only way to automate this process is to integrate different technologies, including computer vision, natural language processing, robotic process automation and machine learning, to make this process more convenient for customers, and more automated and reliable for the firm.

Automated solutions will certainly mean a revision in the customer experience. And companies must evolve their interaction and engagement with their clients. There has to be a fundamental shift in the way organisations deal with their stakeholder

Case 2

Using intelligent automation to transform a bank's customer experience

A leading bank uses intelligent automation (IA) to end-to-end automate the account opening process for a loan, called the “onboarding process” in banking. The main objectives of this process are to collect and assess client data to provide better service and manage risk. In the past, this was mostly manual, and a long and painful process for clients and employees alike.

The automated solution uses chatbots which operate 24/7 to welcome prospective clients and answer questions. Application programming interfaces allow the sharing of data between the bank and government regulator to verify citizens' information, and the integration of client information from other sources including social media. Computer vision and natural language processing help to digitise and intelligently process unstructured documents such as bills, contracts, and identity documents.

The customer experience is transformed. A prospective customer receives a customised loan offer that is predicted to fit with his (or her) expectations and current activities through different media such as web popups, emails, or Google Ads. Upon expressing interest, the potential customer is channelled to the bank's loan website, and a chatbot provides explanations about the different loan offers available and their terms and conditions.

The customer's questions are answered by the chatbot, and more complex questions are



referred to a human agent. The customer is then guided to fill-in his information on the online loan application platform, with some information pre-filled using data bridges created with other platforms such as government or social media sites.

A pre-assessment of the loan application with an in-principle approval is generated, and the customer is prompted to upload documents such as employment contracts or payslips to confirm his home address and income level. Depending on the amount requested and the customer's profile, the outcome can be provided in a few minutes or hours. When the confirmation is sent to the customer (via email), the customer is invited to review the loan contract and sign it online.

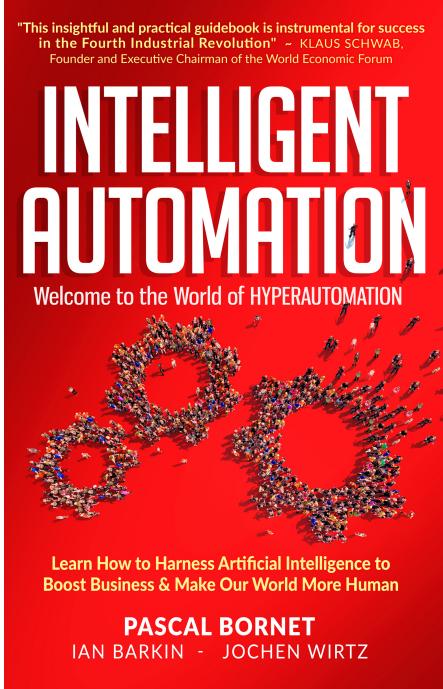
This end-to-end process automation has resulted in a reduction of processing time by over 90 per cent, a cost reduction of over 80 per cent, enhanced compliance, and a significantly improved customer experience. Over 18 months, the bank saw its total costs reduced by 15 to 20 per cent and its revenues increased by 10 per cent.

universe, including suppliers, partners, networks and even competitors.

Clearly, these rapid technological developments provide opportunities for nimble and smart Asian firms, but the scalability of these technologies is likely to also lead to the dramatic consolidation

of virtually all service industries. Directors need ensure that the companies they work with will be ahead of the curve and are prepared. ■

This article is based on the book Intelligent Automation - Learn How to Harness Artificial Intelligence to Boost Business and Make Our World More Human, by Pascal Bornet, Ian Barkin and Jochen Wirtz, 2021.



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