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# Organizational Ambidexterity: Cost-Effective Service Excellence, Service Robots, and Artificial Intelligence

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## INTRODUCTION

Although the general view is that service excellence and cost-effectiveness are in conflict, there are organizations that achieve both. The term cost-effective service excellence (CESE) refers to organizations that are simultaneously among the best performers in their competitive set in terms of customer satisfaction and productivity. Celebrated organizations that achieved CESE include Amazon (online retailer, US), Narayana Health (hospital group, India), Ristorante D'O (Michelin-starred restaurant, Italy), Singapore Airlines, and The Vanguard Group (investment management group, US). Illustrations on how these organizations achieved CESE will be used throughout this article.

Strategy experts consider it difficult to combine the supposedly incompatible strategies of differentiation (e.g., through service excellence and continuous innovation) and cost leadership. It is generally considered not possible to do so for a sustained period of time because these strategies entail contradictory investments and organizational processes. Organizations risk being “stuck in the middle.” Many strategy experts contend that companies must choose between differentiation (e.g., on service excellence) to combat commoditization or cost leadership (e.g., in markets where it is difficult to command a price premium).

This tradeoff between customer satisfaction and productivity has been widely acknowledged in the service marketing and operations management literature. Too strong a focus on productivity comes with cost reduction that frequently affects customer satisfaction, and too strong a focus

on customer satisfaction generally requires more labor, increases cost and thereby reduces productivity. This trade-off is especially pronounced when frontline employees are involved in time-consuming customization. For example, reducing class sizes to improve the learning experience of students or increasing the frequency of trains to increase passenger convenience both increase satisfaction but also reduce productivity. Likewise, increasing the number of agents in a customer contact center improves service as reduced waiting times makes it easier for customers to contact an agent, but it also reduces labor productivity and increases costs.

Nevertheless, cost-effectiveness is important as, everything else being equal, lower costs and higher productivity translate into improved financial performance. Service excellence is also critically important as the relationship between customer satisfaction and key outcome variables, including positive word-of-mouth, repeat purchase, share-of-wallet, and cross-buying, is generally positive, linear, and convex at high levels of customer satisfaction and increases sharply for firms with high levels of customer satisfaction. Customers can become a firm’s “apostles” at high levels of satisfaction or even more likely with delight. As such, it is desirable for firms to be at the leading edge in terms of balancing both customer satisfaction and productivity in their respective industries.

However, few service organizations seem to be capable of pursuing a strategy focused on customer satisfaction and productivity at the same time given that each objective requires a distinctive organizational culture. Therefore, pursuing this dual objective strategy is a daunting task. One strategic pathway toward CESE that has been advanced in the literature is the dual culture strategy. This article reviews and synthesizes recent research on organizational

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ambidexterity related to CESE (i.e., on how to build a dual culture that focuses on service excellence and cost-effectiveness at the same time) and, as part of this discussion, the potential of robotics and artificial intelligence (AI) in service operations and their impact on an organization’s human resources (HR) strategy. Recent developments in these areas warrant senior management attention.

### ACHIEVING COST-EFFECTIVE SERVICE EXCELLENCE THROUGH ORGANIZATIONAL AMBIDEXTERITY

In management, the pursuit of conflicting organizational goals has been studied in the ambidexterity literature. Ambidexterity describes how organizations are able to simultaneously pursue courses of action along different, often conflicting dimensions. Dimensions that have been studied extensively include exploitation (e.g., enhancing cash flows through fine-tuning of current operations) versus exploration (e.g., R&D to develop a new generation of break-through products), incremental versus radical innovation, continuous versus radical change, and efficient versus flexible organizational structure, but only recent work has focused on cost-effectiveness versus service excellence. Furthermore, robust findings link ambidexterity to organizational performance.

To be ambidextrous, organizations must resolve internal conflicts for resources as well as shift demands in their task environments. Recent research has explored service organizations’ simultaneous focus on cost-effectiveness and service excellence that uses organizational ambidexterity to drive the deployment of generic productivity strategies

and tools to the extreme while at the same time being exceedingly customer centric and focusing on service excellence. This approach is called the dual culture strategy whereby CESE can be achieved by combining the three types of leadership, contextual and structural ambidexterity. To these three I add a fourth type of ambidexterity – service delivery mode ambidexterity. This is where service robots and AI have the potential to be game changers for many service organizations but require a careful dual focus on authentic emotions and deep acting by service employees versus the high scalability and productivity of service delivery by robots and AI. The interplay of the four types of ambidexterity is shown in Figure 1.

#### Leadership Ambidexterity

Leadership ambidexterity can enable organizations to manage conflicting demands. Senior management’s paradoxical frames lead to a “both/and logic” rather than an “either/or logic”. This view enables positive conflict and allows leaders to embrace rather than avoid contradictions. Leaders then play a critical role in putting the systems in place that allow supportive contexts for ambidexterity to emerge, and focus and energize the organization on these key ideas, role model the desired ambidextrous behaviors, and then reinforce them with rewards and recognition.

In a CESE dual culture approach, it seems imperative that leadership pushes and even rallies their organizations to pursue a dual culture, which is typically done through internal communications, training, and incentive and recognition systems. For example, Jeff Bezos, Amazon’s CEO, was known

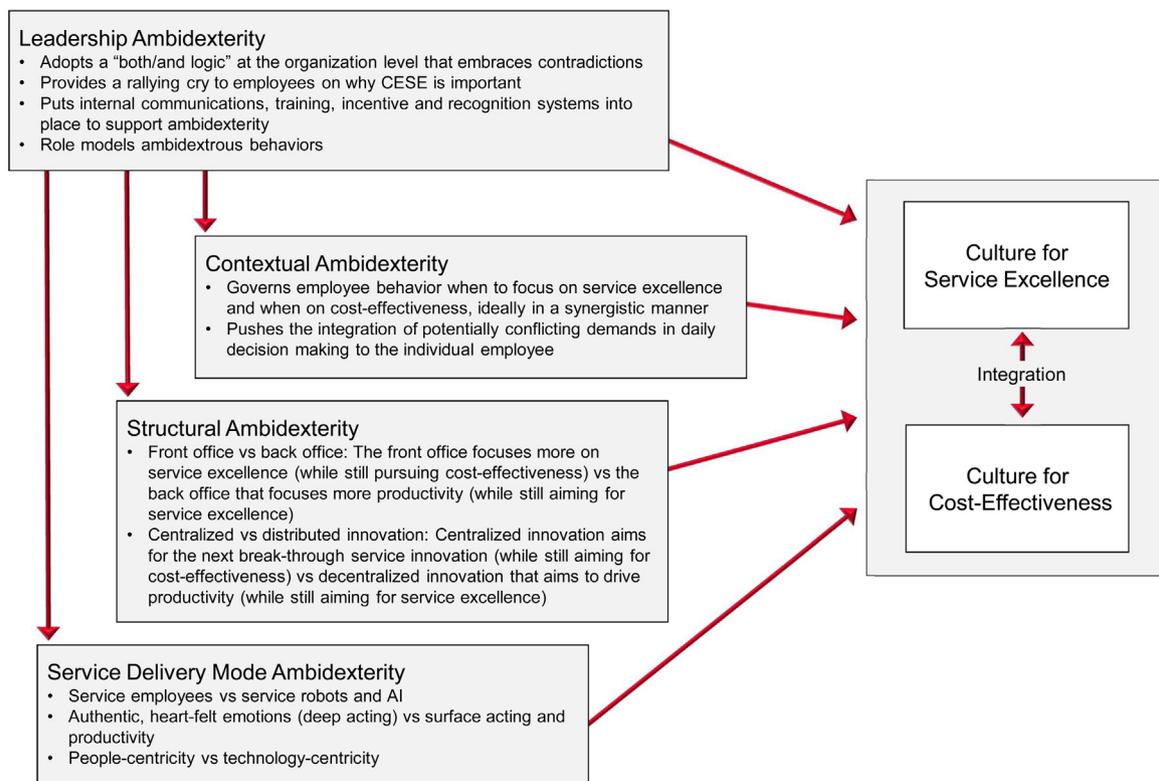


Figure 1 Dual culture strategy to achieve cost-effective service excellence (CESE)

to put the needs of customers first. He was infamous for becoming enraged when individual customers complained, requiring that anxious employees chase down solutions immediately. At the same time, he role-modelled and communicated frugality on anything that did not relate to customers. Customer obsession and frugality were core values at Amazon. John Bogle, Vanguard's founder and former CEO, emphasized the organization's strategy to "provide the highest quality of investor services, at the lowest possible cost". Vanguard emphasized frugality even when recruiting by looking for crew members who understood and sympathized with the need for frugality.

At Narayana Health, the leadership emphasized its belief that "the notion that 'if you want quality, you have to pay for it' went out the window a long time ago". Senior employees received daily text messages detailing the previous day's expenses to keep them cost conscious and motivate them to generate ideas for cost savings and process improvements. Chef Davide Oldani, founder and head chef of Ristorante D'O, was passionate about making the Michelin-starred restaurant accessible to a broad audience and constantly communicated this to key stakeholders.

Another example is Singapore Airlines, whose leadership, internal communications, and training continuously emphasized that profit is a function both of service excellence (which drives the loyalty of demanding business travelers, its core target segment) and costs (the other side of the profit equation). To reinforce that message, Singapore Airlines offered bonuses of up to 50 percent of employees' annual salaries to share the airline's profitability but also would cut basic pay by up to 20 percent when it was making losses. The result was a culture that became exceedingly customer-centric and that internalized the idea that anything that touched the customer must be consistent with Singapore Airlines' premium positioning. On the other hand, everything behind the scene was subject to extreme cost control with employees focusing intensely on cutting cost and improving productivity.

Leadership ambidexterity is also key to drive the other three types of ambidexterity discussed in this article. Leaders have to set the tone and drive contextual, structural and service delivery mode ambidexterity to achieve a culture of CESE.

### Contextual Ambidexterity

Contextual ambidexterity involves achieving alignment by pushing the integration of conflicting objectives to the individual employee. Individual-level behavior is then shaped by the context to enable and encourage employees to exercise their judgment in dealing with conflicting demands. Contextual ambidexterity is obvious in many dual culture organizations where it governs employees' thinking and decision making about when to focus on service excellence, when to emphasize cost-effectiveness, and—ideally—how to integrate both objectives synergistically. Often, both objectives are aligned and can be pursued at the same time, but sometimes tradeoffs have to be made. Here, employees needed to know how to make such decisions, and an internalized dual culture provides this governance mechanism. For example, Singapore Airlines served Krug Grande Cuvée and Dom Pérignon in first class. To minimize costs, cabin crews offered whichever bottle

was open unless a passenger specifically requested the other brand. No cost seemed too small to reduce.

Narayana Health had an intense focus on surgery quality and success rates. Yet its surgeons constantly compared and generated ideas across their network on how to cut costs, such as through the routine reuse of medical devices that were sold as single-use products. For example, the \$160 steel clamps that were employed during open-heart surgeries were sterilized and reused up to 80 times.

Similar observations could be made at Amazon and Vanguard where tradeoff decisions were pushed to decision makers to integrate the conflicting objectives. As stated in Amazon's leadership principles: "Frugality – We try not to spend money on things that don't matter to customers. Frugality breeds resourcefulness, self-sufficiency and invention". At Vanguard, the celebrity analyst Mabel Yu who was instrumental in Vanguard's decision not to invest in triple A-rated complex mortgage-based securities in the run-up to the 2008/9 financial crisis and avoided billions of dollars of losses was recognized with a lunch by John Bogle; consistent with its culture, it was held in the canteen and followed the Vanguard \$5 lunch coupon celebration tradition. As Yu put it, "He is very frugal, so I wanted to do it his way". As these examples show, leadership and contextual ambidexterity go hand-in-hand.

### Structural Ambidexterity

Structural ambidexterity involves separating organizational units to allow units with different competencies to address inconsistent demands. Structural ambidexterity can play a supporting role in achieving CESE. For example, Singapore Airlines invested heavily in a centralized innovation department, a separate unit that was responsible for developing its next industry-leading in-flight service products. However, there are two important departures from the management literature related to structural ambidexterity in a CESE context.

First, in the dual culture of CESE, all departments (albeit with different emphasis) must be involved, which differs from the traditional view of structural ambidexterity seen in the management literature. For example, Singapore Airlines' centralized innovation department not only focused on service and in-flight product innovation but also rigorously emphasized costs. When the company launched the then-widest business class seat in the industry, it designed it in a way that wowed travelers: the seat could be flipped over and turned into a flat bed with a duvet and bigger pillows. Because the "flipping" was done manually, the number of heavy and engineering-intensive motors in a seat was reduced and provided significant savings in fuel, repair and maintenance, and purchase costs.

Second, although not completely separated structurally, dual culture organizations distinguish between the customer-facing front office and the back office. The front office is generally more customer- and service excellence-focused than the back office. Even in Singapore Airlines, the cost squeeze was less intense when related to in-flight service excellence and cabin crew, who had extensive training, reasonable travel allowances, and expensive uniforms. In the back office, Singapore Airlines drove distributed innovation throughout the organization. As these departments were largely not customer-facing, their focus tended to

be on cutting labor and costs. But again, potential customer impact was always considered so that service excellence would not be compromised. That is, the front and back office are both customer-centric and cost-conscious at the same time, and the cost- and service excellence-foci differ only in degree and not in substance. As such, while structural ambidexterity can have a supporting role, it is unlikely to be a key enabler for CESE.

### Getting Buy-In from Employees

The focus on service excellence, while difficult to achieve, is a corporate mission that is more attractive to employees than one focusing on cost-cutting and frugality. It is easier to establish buy-in from employees for the former, largely because they tend to feel pride being associated with an excellent organization. However, when asked to be cost-effective at the same time, employees tend to find this mission difficult to accept. For example, in spite of Amazon's top American Customer Satisfaction Index (ACSI) ratings, it did not appear anywhere on the lists of best companies to work for and was even accused of achieving its high level of productivity by squeezing employees. Similarly, Singapore Airlines walked a fine line between employee satisfaction and keeping costs low as indicated by periodic employee complaints of unhappiness over pay and medical leave policies that were viewed as stingy.

High productivity and cost-effectiveness combined with customer centrality can put a strain on employees. This can be addressed by emphasizing various rationales for expecting cost-effectiveness and service excellence at the same time to obtain buy-in. Examples include a mission to provide the best customer value (e.g., Amazon), recognition that the company operates in a hyper-competitive industry that challenges survival (e.g., Singapore Airlines), appreciation that employees are working for members (e.g., Vanguard) and supporting a charitable cause (e.g., Narayana Health). A dual culture strategy requires a strong rationale for employees concerning why cost-effectiveness is critical in addition to service excellence, and that employees need a credible "rallying cry" to be willing to subscribe to a dual culture.

### Dual Culture Drives Organizations towards Operational Best Practice

Service organizations that want to improve efficiency can reduce the gap between their actual and potential levels of efficiency to achieve the desired level of customer service. That is, they move closer to operational best practice and become masters at exploring, implementing and further improving what is generally referred to as generic productivity strategies and tools. These strategies and tools include cost control, waste reduction, training and motivation of employees (to do things faster, better, and cheaper), improved capacity utilization, redesign of customer service processes, outsourcing of non-core activities, and tiering of service to allocate resources to more important customers.

Many of the strategies and activities that drive cost-effectiveness are not in conflict with service excellence. In fact, productivity improvements frequently bring quality improvements with them. For instance, if customer service

processes are redesigned to be leaner, faster, and more convenient by eliminating non-value adding work steps, then both productivity and customer satisfaction improve at the same time. Unfortunately, the service operations management literature is typically not specifically concerned with service excellence, and generic productivity strategies in themselves do not necessarily lead to excellent service. Therefore, a culture of service excellence is required. Integrating these two literatures, one can argue that a dual culture strategy allows organizations to drive generic productivity tools to the extreme. In these instances, employees are focused on closing the gap between potential and actual efficiency while maintaining service excellence.

Indeed, leadership of dual culture organizations are masters of using generic productivity strategies and tools to cut costs and boost productivity, while managing for service excellence. These organizations are driven to examine every aspect of their operations to reduce costs and use the full gamut of management, operations, and technology tools to boost productivity. For example, Milan's Ristorante D'O examined every aspect of the restaurant operation to reduce costs. It introduced multi-tasking (with the chefs serving the food so they could operate without waiters), leading to a significant reduction in labor costs. It chose glasses and plates that could withstand breakage to reduce replacement costs. It is located in a low rent area (situated 20 km away from the city, where rent was estimated to be half of that for restaurants in the center of Milan) and runs at 100 percent capacity utilization for one lunch and two dinner shifts to reduce unit costs (most Michelin-starred restaurants have only one dinner seating per day). Similarly, Vanguard streamlined its entire operations—including back office, distribution, and marketing—to remove all unnecessary costs. Narayana Health introduced a host of measures to lower costs, such as redesigning the processes before and after surgery to allow the use of operating theatres for 20 hours a day.

In summary, dual culture strategy refers to organizations that achieved CESE through ambidexterity (i.e., leadership, contextual, and structural ambidexterity), making both service excellence and productivity integral parts of their organizational culture. Furthermore, CESE permeates the entire organization and seems more complex than the typical exploration (e.g., innovation) and exploitation (e.g., running robust and efficient processes) conflict. It also requires a rationale for employees to buy into and practice CESE. Here, contextual ambidexterity rallied by strong leadership ambidexterity is key for addressing the challenges related to root causes of the productivity–satisfaction tradeoff (e.g., distributed operations and customer-induced process variability) which permeate the entire service organization. That is, leadership ambidexterity and contextual ambidexterity are most critical in achieving CESE, with structural ambidexterity playing a supportive role.

A fourth type of ambidexterity related to the service delivery mode (i.e. people vs robot/AI-delivered service) is emerging and discussed next.

### SERVICE DELIVERY MODE AMBIDEXTERITY

Emerging technologies in service robotics and AI provide exciting opportunities but also require trade-offs which need

to be integrated, including having heartfelt, authentic emotions expressed by service employees versus productivity and scalability offered by robots and AI. I term this dual focus service delivery mode ambidexterity.

A dual focus service delivery mode culture helps organizations to remain at the cutting edge of technology while still providing the expected level of human touch in the customer experience. This is particularly exciting now as the service sector appears to be at an inflection point with regard to the productivity gains and service industrialization new technology offers, similar to the industrial revolution in manufacturing that started in the 18th century. Rapidly developing technologies that become better, smarter, smaller, and cheaper are transforming virtually all service sectors. Especially exciting are the opportunities offered by developments in robotics, AI, analytics, big data, mobile technology, the Internet of Things, geo tagging, virtual reality, speech recognition, and biometrics that are bringing opportunities for a wide range of service innovations that have the potential to dramatically improve the customer experience, service quality and productivity all at the same time. What happened in information processing services (e.g., financial, insurance and telecommunications services) through websites, apps and mobile technologies seems ready to happen next for people processing (e.g., in healthcare, hospitality, transportation, and even hair stylist services) and possession processing services (e.g., delivery, repair, and cleaning services). Autonomous taxis, drone-deliveries, and largely robot-staffed hotels and restaurants are only the beginning of this revolution.

Robot- and AI-delivered services are likely to show unprecedented economies of scale and scope as the bulk of the costs incur at their development (e.g., in training an AI). Physical robots cost a fraction of adding headcount and virtual robots can be deployed at negligible incremental costs. For example, a hologram-based robot providing service at an information counter will just require low-cost components, and fully virtual robots (e.g., voice-based chatbots in an app or on a website) have close to zero incremental costs.

Similar to the shift that started in the industrial revolution from craftsmen to mass production, an accelerated shift in the service sector towards business models that are based on modular services, self-service technologies, robotics, AI, and focused service factories (i.e., service operations, such as clinics that just perform Lasik surgeries, that are tailored to specific customer needs that hard-wire excellent quality and high productivity through focus in design of service processes) is already occurring. As in manufacturing, the craftsman-equivalent in services will still be a viable business model, but mostly at a high price. The mass market for many services is likely to shift to lower-cost business models with an increasing deployment of service robots and AI. However, trade-offs and integration of often conflicting customer needs will require an ambidextrous approach to the wide-spread deployment of service robots and AI as discussed next.

### People versus Robot/AI-Delivered Services

The anticipated rapid deployment of service robots and AI is expected to have important implications for HR and service

strategies as there are crucial differences between people- and robot-delivered service operations (see Table 1 for key differences between frontline employees and robots/AI) that are likely to require integration and ambidextrous approaches. First, employees are individuals with their own capabilities, perceptions and biases, and people-delivered service shows heterogeneity over time and across individuals. Employees need to have a deep understanding of their customers and service processes to deliver results for customers and the organization. These people need to learn the routines, memorize relevant information and understand how to use IT systems. To achieve this, training is needed. Furthermore, connecting employees to knowledge bases and Customer Relationship Management (CRM) systems require added work steps and effort. This training takes time and is not entirely seamless.

In contrast, service robots are likely to be the visible and customer-facing part of a large and integrated service system. For example, in addition to their local input channels (e.g., cameras, microphones, and sensors) they can access data from a wide range of other sources including the Internet, the collective organizational knowledgebase and its CRM system which contains customer background, preference and transaction data. Combined with biometrics (e.g., facial and voice recognition systems), a service robot will be able to identify a customer and provide highly customized and personalized service on scale at negligible marginal cost. Furthermore, service robots can be designed to have no biases (e.g., by ethnic group, gender, age and social status) unless so programmed (e.g., to treat 'high-value' customers special).

Robots can be designed to be almost indistinguishable from humans, especially on phone and in messaging interactions. Even for face-to-face service encounters, robots can visually resemble humans closely and possess high levels of anthropomorphism, can be designed to appear to have social intelligence, observe accepted social norms (e.g., display the appropriate actions and emotions), and robots have been shown to instill an automated social presence (ASP) where consumers are able to feel that they are with another social being.

Designing robots so that customers trust them seems more tricky but achievable. Emotional trust is the extent to which customers feel secure and psychologically comfortable about depending on a service robot, and benevolence trust pertains to the care and concern that customers feel that the robot has for their genuine welfare. The extent to which service robots can display the emotions (e.g., empathy and compassion) and behaviors that give the impression that they truly have the customer's interests at heart have so far proven to be a challenge. It seems easier for customers to believe and trust that an actual service employee understands them, empathizes with them and is on their side (e.g., sometimes even bending company rules to accommodate a customer). It remains to be seen whether a robot can provide the same emotional connection and gain the resulting trust, and not be seen as being merely an extension of the organization's machinery (i.e., as one would view a self-service technology).

Also, people show a general aversion towards algorithms used in AI applications, especially when they have seen an algorithm making a mistake, which inevitably will happen.

**Table 1** Frontline employees versus service robots and AI

Dimension	Service employees	Service robots/AI
Service training and learning	<ul style="list-style-type: none"> <li>• Act as individuals</li> <li>• Need training</li> <li>• Individual learning</li> <li>• Limited memory and access</li> <li>• Understanding needed</li> </ul>	<ul style="list-style-type: none"> <li>• Act as part of systems, are connected</li> <li>• Upgradable, system-wide</li> <li>• System learning</li> <li>• Virtually endless memory and access</li> <li>• Pattern recognition</li> </ul>
Customer experience	<ul style="list-style-type: none"> <li>• Heterogeneous output</li> <li>• Customization and personalization depend on employee skill and effort</li> <li>• Unintended biases</li> </ul>	<ul style="list-style-type: none"> <li>• Homogenous output</li> <li>• Customization and personalization can be delivered on scale at consistent quality and performance</li> <li>• Potentially no biases</li> </ul>
	<ul style="list-style-type: none"> <li>• Have genuine emotions</li> <li>• Can engage in deep acting</li> </ul>	<ul style="list-style-type: none"> <li>• Can mimic emotions</li> <li>• Can engage in surface acting</li> </ul>
	<ul style="list-style-type: none"> <li>• Can engage in out-of-box thinking and creative problem solving</li> <li>• Good in professional service roles (PSRs)</li> </ul>	<ul style="list-style-type: none"> <li>• Limited out-of-box thinking, have rule-bound limits</li> <li>• Good in subordinate service roles (SSR)</li> </ul>
Firm strategy	<ul style="list-style-type: none"> <li>• Service employees can be a source of competitive advantage</li> <li>• High incremental cost</li> <li>• Low economies of scale and scope</li> <li>• Differentiation on service can be based on better hiring, selection, training, motivation, and organization of service employees</li> </ul>	<ul style="list-style-type: none"> <li>• Service robots are unlikely to be a source of competitive advantage</li> <li>• Low incremental cost</li> <li>• High economies of scale and scope</li> <li>• Economies of scale and scope and related network and service platform effects will become important sources of competitive advantage.</li> </ul>
Implications for society	<ul style="list-style-type: none"> <li>• Important services are expensive and scarce if delivered by service employees (e.g., healthcare and education)</li> <li>• Many service employees work in unattractive jobs (e.g., call center agents and cashiers)</li> </ul>	<ul style="list-style-type: none"> <li>• Cost savings of robot/AI-delivered services will be competed away, leading to lower prices, increased consumption and higher standards of living</li> <li>• Mundane and unattractive service jobs can be robot/AI-delivered</li> </ul>

Adapted from Wirtz et al. (2018).

Algorithm aversion holds even in situations where evidence-based algorithms consistently outperform humans. People seem to forgive people, but quickly lose trust in an AI that makes a mistake. As such, service robots should to be designed as much as possible to be perceived as trustworthy and as having the customers’ best interests at heart.

Finally, rapport seems essential where social closeness and affiliation are central to a service, which is often the case for services such as education, elderly care and high-risk financial services. Robot design can help to build rapport. For example, human-like hand gestures, eye movement, postures and appropriate verbal acknowledgments can improve customer-robot rapport. In an aged care facility, residents interacted with robots on rehabilitation assistance, playing games, having conversations and having exercise classes led by robots. As one resident noted, “Even when we can just watch them, they make us laugh and feel happier”, while another referred to a robot as “their friend”.

Although the ability to design robots that display emotions, and build trust and rapport is possible, service robots are unlikely to be able to display genuine emotions in the foreseeable future. Nonetheless, today’s robots are able to mimic the expression of emotional responses (e.g., using facial expressions and body language). Research shows that these robots which can mimic the emotional expression of

their human counterpart are perceived by that person as more pleasant. As such, mimicked emotional responses might be sufficient to provide the expected level of human touch for many types of the more mundane service encounters. However, in longer and higher involvement encounters, it is easily apparent that the robot’s expressed emotions are not genuine, and consumers are likely to see this and respond accordingly. At the surface, robots are likely to read, respond and express emotions, as was displayed in the Hollywood feature “Passengers” where the robotic bartender provided counseling and advice to the desperate traveler. However, even in the movie when the robotic bartender was damaged and lost part of its face and body, the actors displayed no emotions towards the robot. That is, surface-acted emotions are seen but, deep inside, customers know that these emotions are not real. In other words, even in the movies customers are unlikely to respond to robot-displayed emotions in the same way that they would to heartfelt and authentic emotions displayed by human frontline employees.

To see the respective strengths of service employees and robots in their ability to display emotions better, a helpful distinction between professional service roles (PSRs) and subordinate service roles (SSRs) illustrates this well. Emotional-social capabilities seem particularly important

for PSRs. Here, complex cognitive tasks are combined with emotional and social tasks that often involve a high degree of flexibility, out-of-the-box thinking, and creative problem solutions (e.g., as for a divorce lawyer, a Ph.D. supervisor, or a surgeon). Most services in this category require humans as they are highly customized, and the service delivery processes and their outcomes are often uncertain. Today's robots, on the other hand, are only flexible within the defined limits and out-of-box thinking seems unattainable for now. Also, it seems unlikely that robots possess the social intelligence and communications skills to adequately deal with the complex emotional issues involved. Therefore, such services are unlikely to be delivered solely by robots until they are developed to the point where they can feel and respond with real emotions, and have mastered key dimensions of social intelligence, including meaningfully connecting with customers' emotions, negotiating with and between people, persuading people, providing emotional support, and instilling trust and building rapport with customers.

Likewise, many of these professional service roles are becoming so complex that even human service providers will feel uncomfortable offering them without AI support. For example, a medical doctor may be unlikely to correctly diagnose many rare diseases, but an AI service robot, able to map all patient data and symptoms against its knowledge base, can provide probabilities of even the rarest diseases for a doctor to consider and explore further. In these cases, the professional will increasingly include AI-trained robots to deliver the service in a human-robot team.

In contrast, for subordinate service roles (SSRs), employees are often lowly paid, have low education, receive little training, have little decision discretion and empowerment, have low engagement and are often not motivated. Employees in such positions tend to engage merely in surface acting (if they 'act' at all). In such positions, robots may well provide better service compared to employees, and in fact, may even be better at displaying surface-acted emotions. That is, robots may outperform people in routine service encounters due to their consistently pleasant surface acting that is unaffected by moods, health, or stereotypical biases. Buying train tickets, renting a car, booking a courier service pick-up, and supermarket checkouts fall into this category. Here, customers generally want reliable, fast and convenient core services. In these types of services, customers may even be indifferent to emotional displays and other social-emotional and relational elements. Thus, for low-level, low-pay SSRs, robots may become the preferred mode of service delivery.

### People, Service Robots and Competitive Advantage

Service robots can have a significant impact on the market level. In people-intensive service industries, employees are often viewed as an organization's most important asset. Following the current dominant service philosophy of the service-profit-chain, competitive advantage is built through the painstakingly careful recruitment, training, and motivation of employees. However, service robots are unlikely to become a key source of competitive advantage, at least in the medium to long-term. For example, ATMs largely

replaced human tellers, and today, hardly any bank positions itself on better ATM-delivered service. These services have become viewed by customers as a commodity. The same is likely to happen regarding service robots which will most likely be developed and manufactured by organizations that sell frontline service solutions to service organizations.

The implication of the potentially reduced importance of frontline employees as a source of competitive advantage and the economics of robot-delivered service mean that economies of scale and scope (e.g., in data and knowledge bases, and training of AIs), and related network and platform effects, are likely to become important sources of competitive advantage. In addition, the remaining factors for potential competitive advantage should also increase in importance and are likely to include an organization-wide service culture, its customer centricity, innovation capabilities, as well as brand equity, owning the customer relationship, owning the point-of-sale (POS), platforms and data.

In sum, it can be assumed that robots in the coming decades will master cognitive and analytical tasks of unprecedented complexity and will be able to mimic surface acting-type emotions at increasingly higher levels. As such, cognitive and analytical tasks with low emotional or social complexity will increasingly be performed by service robots. In contrast, services that are mainly emotional or social in nature and require true emotional displays will be, for the foreseeable future, mostly delivered by humans (see Figure 2). Furthermore, tasks that are cognitively highly complex with high emotional needs are likely to be delivered by humans augmented by robots and AI. Robots already or will shortly outperform humans on cognitive tasks, and optimal solutions will require a balance between humans delivering the emotional aspects of a service with powerful service robots delivering its analytical and cognitive components.

People-delivered service is likely to remain important in many contexts (including complicated service recovery situations) and ambidextrous approaches are needed to navigate the increasing deployment of service robots and AI with the tasks that should remain with the domain of service employees. Service organizations that succeed in this technology revolution will understand how to balance the strengths and weaknesses of service robots and AI versus service employees and master delivery mode ambidexterity by deploying and integrating them effectively.

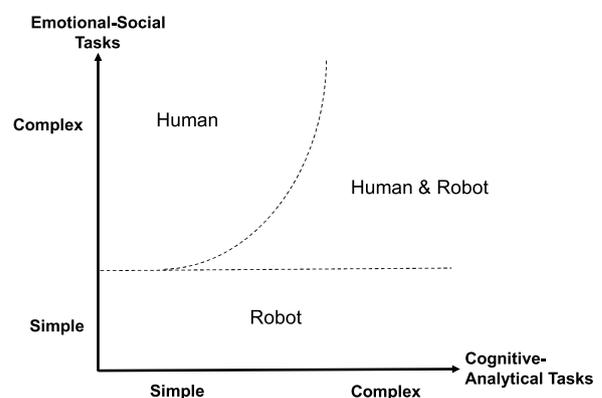


Figure 2 Service robot deployment  
Source Wirtz et al. (2018).

## Implications for HR in Service Organizations

What does this delivery mode ambidexterity mean for HR in service organizations? One can safely predict that there will be fewer employees in SSRs. However, the few employees that remain will become more important for the positioning and differentiation of the firm, and for building customer loyalty. As customer contact with employees will be much less frequent, these remaining interactions are likely to be related to difficult issues, exceptions and service recovery, which require highly skilled and qualified employees. This means, for example, that call centers employing millions of low level and para-professional staff will not be required anymore. One bank I followed in China cut over 1,000 seats in a call center within weeks with the introduction of a chatbot (i.e., an AI) that could answer the most commonly asked questions. Many customers preferred the instantaneously accessible chat bot over a call to the customer contact center. However, AI and robots are unlikely to be effective in handling tricky questions, creative problem solving and responding to complex customer emotions. For these tasks, highly skilled employees will be required. The focus of HR in service organizations will shift from running hundreds of thousands of employees in customer contact centers and branch offices to HR that will more closely resemble the HR strategies of today's professional service firms.

An additional area of interest is the effective management of people-robot teams and what type of soft and hard skills will be required when AI becomes an integral part of decision making processes. Effects on employee's motivation and emotional needs have not yet been explored. More experimentation in industry and academic research will be required to understand better and manage effectively the delivery mode ambidexterity and CESE in balancing service robots and AI with the human touch customers expect in a service.

As the preceding discussion shows, added dimensions in ambidextrous cultures may include people-centric versus technology-centric strategies, and surface acting versus deep acting at the customer interface as service robots and AI become more widely deployed.

## SUMMARY AND CONCLUSIONS

The quality of a service organization's people plays a critical role in determining market success and financial performance. Behind most of today's successful service organizations stands a firm commitment to the effective management of human resources, including their recruitment, selection, training, motivation and retention. Excellent HR strategies aligned with strong management leadership frequently lead to a sustainable competitive advantage as it is often harder to duplicate high-performing human assets than any other corporate resource. In the past, such a strategy was typically associated with service

excellence and, compared to industry average, higher operating costs. However, I am convinced that future-looking leaders and HR department will increasingly experiment with, implement and fine-tune CESE strategies using a dual culture approach, which will include customer-facing service robots and AI in most business models.

Service excellence and cost-effectiveness are perceived to be in conflict, yet there are organizations that achieve both. Organizations that successfully pursue a dual strategy have been shown to outperform their peers. I believe that competitive pressures will make it critical to take the management of such contradictions and paradoxes seriously. This article shows that the successful management of service excellence and cost-effectiveness doesn't have to be a conflict in objectives as a balance can be achieved by those firms that are ambidextrous.

Organizations that successfully achieve a dual culture strategy are able to combine an intense focus on costs with an equally passionate customer centricity and a focus on service excellence. Specifically, they show a focused deployment of generic productivity strategies and tools that allow them to minimize the gap between actual and potential efficiency in their service operations while delivering service excellence. This dual culture strategy pushes both customer satisfaction and productivity towards best practice and creates a culture that drives employees to integrate customer satisfaction and productivity whenever they conflict.

Furthermore, the dual culture approach requires a rationale, a rallying cry employees can buy into as it helps them see that it's not counterintuitive to offer great service externally while being stingy internally. Being cost conscious (especially on employee salaries and benefits) must be sold effectively to employees and senior management must have a convincing narrative as to why a cost focus is necessary. That is, senior management must drive a culture of cost-consciousness and service excellence simultaneously.

Intensifying competition and cost pressures increasingly push organizations to seek new ways to increase efficiencies while maintaining high levels of service quality. There is a palpable shift across many industries toward a more rigorous application of generic productivity strategies, and a dual culture strategy may offer a promising approach to moving actual efficiency levels close to their maximum potential while still retaining the service quality its customers expect. That is, organizations and their HR departments will increasingly need to embrace and drive ambidexterity related to service excellence and productivity/cost-effectiveness, and the development, deployment and integration of robots and AI into teams with people.

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