

HOW SMART, CONNECTED PRODUCTS CHANGE SERVICES

For companies grappling with the transition, organizational issues are now center stage—and there is no playbook. We are just beginning the process of rewriting the organization chart that has been in place for decades.

While the transition may be unsettling and destabilizing for many companies and raise real competitive challenges and security concerns, it is important to see smart, connected products first and foremost as a chance to improve economies and society. Because of these new products, we are poised to make great progress in environmental stewardship—substantially increasing the efficiency of land, water, and materials use, as well as energy efficiency and the productivity of the food system. They can help us achieve major advances in the human condition—in health, safety, mobility, training, and more—and help us with daily challenges, like easily finding a parking place.

And they position us to change the trajectory of society's overall consumption. After decades of ever more, ever cheaper, and ever more disposable everything, businesses and consumers may well need fewer things. Smart, connected products will free us to purchase only the goods and services we need, to share products that we do not use much, and to get more out of the products that we already have. Instead of tossing out old products for the next generation, we will hold on to products that are continually improved, upgraded, and modernized.

But what about work? Any major technological discontinuity raises inevitable concerns about its effect on jobs and opportunity, particularly in this day and age. We believe that the exponential opportunities for innovation presented by smart, connected products, together with the huge expansion of data they create about almost everything, will be a net generator of economic growth. These new types of products will not reduce our needs or the number of people required to meet them. Instead, new industries, new services, and new roles will be created that can allow more people to meet their aspirations.

What about those without the education and skills needed for the first wave of jobs in the transition? Those skills are in short supply, but the broader impact on employment and growth is likely to be positive. There will be more innovation and many new businesses. And smart, connected products can be a leveler, allowing people to work more productively and in less rote and repetitive ways. Equip a

While the effects of smart, connected products begin in manufacturing, they flow to service industries as well.

Many service industries, including airlines, hospitality, health care, and financial services, rely on products that will become smart and connected. An airline with smart, connected planes, onboard flight systems, and baggage compartments can operate with far greater efficiency. Maintenance issues, for example, can be identified in flight, and the needed parts and expertise can be waiting when the plane lands. A laundromat at a college dormitory with smart, connected washers and dryers can inform users about machine availability and when loads are done. The washers and dryers can instantly notify maintenance personnel of failures, enabling rapid repair.

In health care, the utilization of expensive equipment, space, and clinical staff will be substantially improved, producing better care and patient experiences. Smart medical devices (like smart, connected pacemakers) can allow clinicians to track patients remotely and take more-appropriate and timely action. The opportunities for such monitoring—and for integrating disparate real-time data to gain new insights and inform lifestyle improvements—are game changing.

Even low-tech services will incorporate smart, connected devices. A cleaning company will place sensors in washroom doors or meeting rooms in order to focus on just the spaces that need cleaning. A parking garage will install sensors in individual parking spaces. A smartphone app will guide drivers to open spaces, reducing congestion and improving space utilization. The app will also enable ticketless, barrier-free payment while allowing dynamic pricing that reflects minute-by-minute demand patterns.

And entirely new services will be created. Uber has disrupted traditional taxi and livery businesses through its ability to tap huge unused transportation capacity. It's bringing many new drivers into the workforce and then identifying and matching the locations of drivers and passengers. The range of potential new services enabled by smart, connected products is limited only by the imagination.

service technician with an augmented reality application and a smartphone, and he or she can do a complex repair even with limited training. Less skilled workers can be coached and guided far more easily by experts. Imagine how a landscaper's job could change when yards and gardens are instrumented with sensors that provide information about the soil, watering history, plant health, and problem areas.

Manufacturers are leading the charge toward this future. The product and organizational transformations required are difficult and uncertain. The companies and other institutions that can speed this journey will prosper and make a profound difference for society. ▀

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DISCLOSURE: PTC DOES BUSINESS WITH MORE THAN 28,000 COMPANIES WORLDWIDE, MANY OF WHICH ARE MENTIONED IN THIS ARTICLE.