

# HOW TO PURSUE THE OPPORTUNITIES

A decorative graphic on a blue background. It features several glowing circles of varying sizes, some with dotted outlines, and a series of light blue, cylindrical, 3D-style rays that appear to emanate from the bottom left and fan out towards the top right. The overall aesthetic is clean, modern, and tech-oriented.

**What Happens When You  
Turn Your Products Into Services**

**Why Agile Software Development Requires  
Radical Changes in Budgeting and Scoping**

**Raising Your IoT Security Game**

**The Big Opportunities at  
the Junction of AI and Analytics**

# What Happens When You Turn Your Products Into Services

## Author

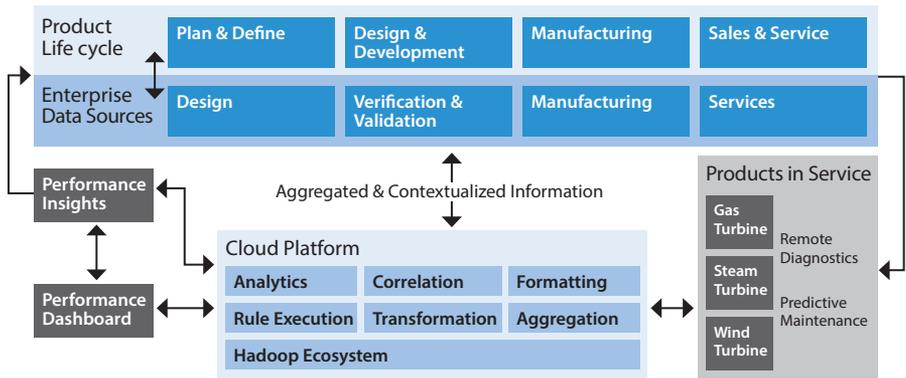
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Manufacturers everywhere are using sensors, software, and wireless connectivity to add features to their products and differentiate them in the marketplace. In this way, digitization and the Internet of Things (IoT) are revolutionizing the sector across categories and geographies.

To be sure, the idea of connected products isn't news to manufacturers. In 1996, General Motors (GM) began offering its on-board OnStar<sup>41</sup> concierge service in Cadillacs. What GM did then has become ubiquitous. General Electric (GE) estimates that investments in industrial IoT alone would surpass \$60 trillion in the next 15 years. Meanwhile, leading B2B and consumer companies are rushing to connect everything they make from jet engines to tractors to refrigerators to electric toothbrushes.

<sup>41</sup> New York Times, G.M. Says OnStar Service Is Making Money After 7 Years, February 27, 2003, Accessed July 21, 2017, <http://www.nytimes.com/2003/02/27/business/company-news-gm-says-onstar-service-is-making-money-after-7-years.html>



**Figure 5:** Illustration of a Closed-Loop System for a typical utilities company that includes the ability to gain performance insights from customers’ experience using energy systems.

It’s a trend that extends beyond major firms. A myriad of startups are seeking investors for all manners of newly imagined, IoT-enabled products. At the 2017 Consumer Electronics Show, a startup called ShadeCraft unfurled a smart patio umbrella.<sup>42</sup>

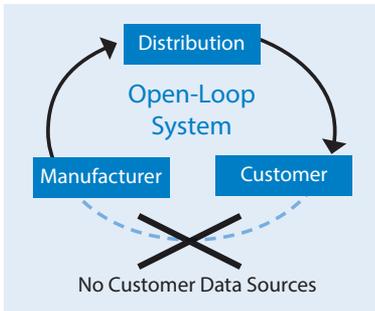
But that isn’t all manufacturers are doing with connected, smart products. In the process of connecting their products, manufacturers are unlocking a new business model. This model harbors a wealth of opportunities for manufacturers to better serve their existing customers, expand their markets, and drive profitable revenue growth.

## Closing the Value-Generation Loop

The powerful new business model in manufacturing is enabled by a mashup of digitization and servitization—that is, the process of adding services to products. When manufacturers add service components to a connected product, they open up new ways to generate value to customers and to themselves. As we describe it, they gain the ability to shift from an open-loop system to a closed-loop system of value generation. Figure 5 describes the aspects of that shift.

<sup>42</sup> Digital Trends, This Smart Patio Shade Can Track and Block the Sun for Your and Play Your Music, January 4, 2017, Accessed July 21, 2017, <https://www.digitaltrends.com/home/shadecraft-sunflower-patio-shade-ces-2017/>

## Lost Opportunities in Open-Loop Systems



Most manufacturers operate in an open-loop system. They sell their products to OEMs or through indirect distribution channels composed of wholesalers, dealers, and/or retailers. As a result, manufacturers don't have direct, real-time sources of data that can tell them how end customers are using (or misusing) their products and how their products are performing (or not performing).

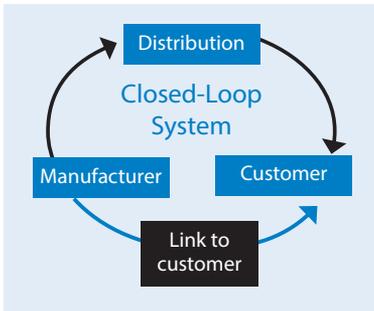
They have limited insight into what benefits or problems their customers experience. Their data on customer usage is 'open,' meaning it escapes their reach.

Most manufacturers are beginning to realize that this open-loop system is a missed opportunity, and that limited contact with end customers is a major obstacle to growth.

Overcoming this obstacle is difficult and expensive. More often than not, manufacturers lose crucial data. Savvy manufacturers try to work with their channel partners, but feedback loops break down and, in many instances, their channel partners simply do not or cannot gather the data. In any case, warranty claims arrive long after customers have been disappointed and the opportunity for a proactive response is gone.

Even more valuable opportunities are lost in an open-loop system. When manufacturers don't have a direct link to their end customers, they don't know and can't respond to how customers use their products (or hack their products to make them do things manufacturers never imagined). These are lost opportunities to build new revenue streams and enhance customer loyalty.

## How Smart, Connected Products Close the Loop



In a closed-loop system, a manufacturer has a direct and ongoing digital link to end customers: access to information about the product, how the customer is using it, and any problems the customer may be having with it.

IoT technologies enable manufacturers to create a closed loop system. When they make their products smart and connected,

manufacturers that sell to OEMs and through indirect distribution channels can maintain a direct link to end customers.

Moreover, emerging technologies are making closed loop systems easier and more economical than ever before. In communications, the new 5G network standard promises much faster transmission of digital data. In computing, public clouds and ever more powerful processing promise to reduce costs associated with storing, analyzing, and gaining insights from customer product usage data.

Closed-loop systems represent a paradigm shift for most manufacturers. Product makers can now know the ultimate truth about their products: how they are performing (or not performing) for customers. They can receive continuous, real-time information about their products while those products are in the end customers' hands. They can understand how efficiently customers are using their products, when the product is nearing a breakdown, and a host of vital information.

Closed-loop systems open up a vast frontier of opportunity for manufacturers that are encompassed in the term servitization.

## The Bountiful Promise of Servitization

Servitization is a fundamental rejiggering of the traditional manufacturing model. It harks back to something Harvard Business School professor Theodore Levitt wrote 40 years ago: “People don’t want to buy a quarter-inch drill, they want a quarter-inch hole.”<sup>43</sup>

A manufacturer that pursues servitization as strategy taps into Levitt’s timeless truth. It shifts its primary focus from creating value by making and selling a product to creating value by delivering a service through a product. The manufacturer may or may not make money selling the product itself, but it does make money by providing the service embedded in the product.

### We find that servitization opportunities come in four flavors:



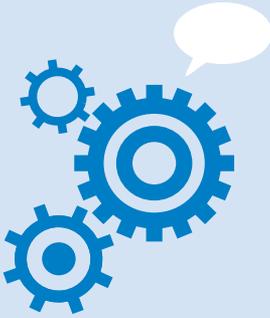
#### 1. Enhancing reliability and uptime.

Whether it’s a truck, boiler, air compressor or any other machine, manufacturers can embed monitoring services in their products. Then, they can act (or alert their customers to act) before product failures occur. This creates customer value by raising product reliability, maximizing uptime, and reducing overall maintenance costs. All this builds value in the brand.

Maersk Drilling’s partnership with GE is an example of this at work. After a successful pilot project, Maersk is deploying a GE system to analyze the performance of 110 key pieces of equipment at nine additional offshore drilling rigs. The sensors on equipment enable GE to tell Maersk when it’s time to perform maintenance, before the equipment breaks down. That saves Maersk time and money.<sup>44</sup>

<sup>43</sup> Harvard Business School Working Knowledge, What Customers Want From Your Products, January 16, 2006, Accessed July 21, 2017, <http://hbswk.hbs.edu/item/what-customers-want-from-your-products>

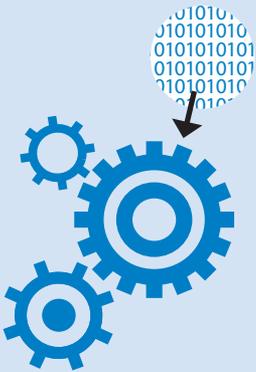
<sup>44</sup> JWN Energy, Maersk Drilling and GE accelerate digital partnership, target 20% efficiency boost, July 19, 2017, Accessed July 21, 2017, <http://www.jwnenergy.com/article/2017/7/maersk-drilling-and-ge-accelerate-digital-partnership-target-20-efficiency-boost/>



## 2. Customer operational improvement.

Manufacturers can embed services that optimize the value customers get from using a product. For instance, Rolls Royce's jet engines include smart technologies and connectivity that enable them to advise airlines on optimal flight speeds and other operating metrics that produce the lowest fuel costs.<sup>45</sup>

Automakers could provide similar services to consumers, for instance, advising them how to accelerate and brake in ways that maximize fuel economy. So could energy utilities—by tracking in real-time precisely how much energy its customers are using and advising them how to reduce their costs.



## 3. Selling new product capabilities.

By embedding service delivery capabilities such as software downloads in their products, manufacturers can tap into new product, subscription, and streaming revenues. Toyota is offering its car owners new mapping systems and other apps that can be downloaded as software.<sup>46</sup> Tesla has offered to sell the owners of its electric vehicles a software download that adjusts the car's suspension settings to provide them with more road clearance at high speeds.<sup>47</sup>

<sup>45</sup> Rolls-Royce plc, Engine health management, Accessed July 21, 2017, <https://www.rolls-royce.com/about/our-technology/enabling-technologies/engine-health-management.aspx#sense>

<sup>46</sup> PR Newswire, 2018 Toyota Camry to Come Equipped with Xevo's Next-Generation Connected Car Technology, July 11, 2017, Accessed July 21, 2017, <http://www.prnewswire.com/news-releases/2018-toyota-camry-to-come-equipped-with-xevos-next-generation-connected-car-technology-300484269.html>

<sup>47</sup> Wired.com, Tesla's Over-the-Air Fix: Best Example Yet of the Internet of Things?, February 2014, Accessed July 21, 2017, <https://www.wired.com/insights/2014/02/teslas-air-fix-best-example-yet-internet-things/>



#### 4. New revenue-generating businesses.

Perhaps the most valuable potential of servitization is when it enables manufacturers to develop entirely new businesses. They can uncover the insights that lead to such businesses by using smart, connected products to gain a deeper understanding of customer experience. Kaeser Kompressoren did this: It no longer sells air compressors; it sells air compression as a service as it monitors the usage of its machines.<sup>48</sup> One reason connected cars have spawned a competitive race in the auto industry is the many revenue-generating businesses they make possible including mobile advertising. Imagine driving your car and getting personalized, location-based offers in your dashboard infotainment system: a hotel just 5 miles ahead offering a 50% discount, or a steak restaurant with tables available on a busy Friday night. That world will soon arrive.

The experience of Mitsubishi Hitachi Power Systems, the maker of thermal power generation systems, shows the potential of the servitization approach. Working with TCS, the global firm is developing an artificial intelligence-based system to adjust the combustion process of coal-fired power plants to reduce costs and carbon-dioxide emissions.<sup>49</sup> The system, which it plans to sell to other plant operators, collects nearly 250 data inputs about the performance of a power boiler. It is designed to determine how best to tune the boiler for maximum efficiency by testing more than 10,000 combinations. The case demonstrates the value of a closed-loop system in which Mitsubishi is combining its expertise in power plants with AI capabilities to sell its engineering and product knowledge as a service.

<sup>48</sup> Americas' SAP Users' Group, Using the Internet of Things to Provide 'Air-as-a-Service,' June 25, 2015, Accessed July 21, 2017, <https://www.asug.com/news/using-the-internet-of-things-to-provide-air-as-a-service>

<sup>49</sup> Nikkei Asian Review, Tata, Japanese partners to use AI at coal-fired power plants, November 20, 2016, Accessed August 2, 2017 at <https://asia.nikkei.com/Business/Companies/Tata-Japanese-partners-to-use-AI-at-coal-fired-power-plants>

## Overcoming the Resistance to Servitization

The promise of servitization is tantalizing. That's why 48% of UK manufacturers are planning to increase their investments in servitization in 2018.<sup>50</sup> Yet 44% admitted they are servitization beginners. They, and indeed, all leaders of manufacturing companies that are seeking to capture the opportunities of servitization, will need to be prepared to encounter internal and external resistance that appears whenever business model change is undertaken. Among the challenges:

 **Core business dominance:** Every well-established company has a dominant core business model. The managers responsible for operating this model often find it difficult to reimagine it. Change can be especially challenging when it involves new and unfamiliar technologies. (Recall that Kodak executives were aware that digital photography threatened the company's survival but failed to act.) Resistance stemming from the dominant business can remain strong even after pilots are run and proof of concept is delivered. Often, manufacturing executives continue to project their own resistance to change on their customers—either claiming customers will not pay for the service or doing little to help sell the service to customers, or both.

**Approach to take:** Conduct design thinking workshops, which employ both an understanding of IT systems and creative problem-solving exercises that look at issues like customer challenges from different viewpoints, to develop ideas for taking the business in new directions. Such exercises help companies to unearth new possibilities for creating value through new business ideas. The process can validate the best ideas while building support for them among different stakeholders.

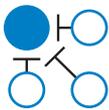
Then evaluate options for a proof of concept project that will test the theory that the company's offerings can include add-on services. Companies must assess their means to collect data on their products. They are likely to determine that they need to collect more.

<sup>50</sup> The Manufacturer's 2017 Annual Manufacturing Report, Accessed July 21, 2017, <https://www.themanufacturer.com/wp-content/uploads/2017/01/Annual-Manufacturing-Report-2017.pdf>



**The silo trap:** Manufacturers, especially large established ones like many of the automakers, are organized into silos (design, engineering, production, marketing, etc.) that all too often operate independently. That can stymie servitization initiatives.

**Approach to take:** Engage executives across functions in a discussion of customer value. Assign a cross-functional team to assess existing information on the customer's experience, including warranty claims and problem reports, and identify strengths, weaknesses and opportunities to expand the view. Then report on options to create a pilot test of a service offering.



**Channel resistance:** Manufacturers that launch servitization initiatives should also expect resistance from their sales, distribution, and service partners. Many dealers rely on a repairs and maintenance revenue that a new service model is expressly intended to reduce or eliminate. Further, servitization often carries with it the very real fear of disintermediation; you should expect dealers and other partners to protect their customer relationships.

**Approach to take:** To overcome channel resistance, manufacturers must reach out to their distribution partners and make accommodations. Proof of concept projects can help build evidence to show the value of new models to reluctant partners.



**Customer inertia:** With 20/20 hindsight, successful products and service bundles (such as Apple's iPod) look like they were no-brainers from the start. But in reality, customers often do not recognize the value of service-embedded products, and don't immediately flock to them. Companies must combat such customer reluctance with effective marketing that clearly states the value of the new offering.

**Approach to take:** Successful servitization requires a concerted effort at educating customers, especially consumers, on the value they would get and its price. Companies must overcome internal resistance and enlist employees in that effort. They should begin their servitization efforts with modest projects that do not require overly complex explanations. And they should be sure that customers understand both the rewards of the service model and the risks of improper use.

## Servitization Is an Imperative

Leading manufacturers of all types are engaging in servitization. Sooner rather than later, those that fail to embed services in their products—and deliver the enhanced customer experiences that servitization promises—are going to be left behind.

This is especially true for any manufacturer that is in an open-loop system. Servitization offers an unprecedented opportunity to build tighter relationships with customers. They can use it to add intelligence to their products, collect valuable data on customer usage, inform design and performance improvements, and test those improvements before rolling them out at scale.

In short, servitization enables manufacturers to improve the reliability of their products, help their customers to obtain superior value, and develop new revenue generating businesses. The technologies needed to start embedding services in B2B and B2C products are available now. No manufacturer should be waiting to see what comes next.