

The Magic That Happens When Manufacturers Digitally Attach Themselves to Their Products

Authors

Sreenivasa Chakravarti

Head, Innovation & Transformation Group, Manufacturing,
Tata Consultancy Services

Subhash Sakorikar

Director, Innovation & Transformation Group, Manufacturing,
Tata Consultancy Services

A growing number of manufacturers are digitally connecting to their products after they leave the shop floor. These companies are monitoring the experience their customers are having with those products throughout the customer lifecycle. By doing so, manufacturers can continue adding value to customers after the sale, and even develop new revenue streams.

This phenomenon is especially visible in industrial manufacturing. For example, one turbine manufacturer is offering remote diagnostics-as-a-service, resolving 85% of alerts remotely. That reduces turbine downtime (saving the customer money) and the frequency of field service visits (lowering its costs and customers' service costs).

Such digital connectivity allows aircraft engine makers like General Electric and Pratt & Whitney to monitor engine performance even during flights. By doing so, these manufacturers have evolved a new business model of ‘servitization’—charging customers ‘power by the hour,’ rather than selling or leasing their engines outright. That generates a recurring revenue stream, while eliminating a significant capital expense and maintenance costs for customers.

A 2015 TCS Global Trends Study found the industrial manufacturing sector was second out of 13 global industries surveyed in what the average company spent on IoT as a percentage of revenue.⁶¹

All this is made possible by the Internet of Things (IoT), which is increasingly penetrating all areas of manufacturing. A more recent study by IDC found the industrial manufacturing sector is now number one in IoT spending.⁶²

⁶¹ TCS, The Internet of Things: The Complete Reimaginative Force, accessed May 18, 2017, <http://sites.tcs.com/internet-of-things/#>

⁶² ZD Net, The five industries leading the IoT revolution, February 1, 2017, accessed May 18, 2017, <http://www.zdnet.com/article/the-five-industries-leading-the-iot-revolution/>

The Competitive Advantage of a Deeper Customer Understanding

A company's ability to deeply understand how customers are using its products is transformational. GE CEO, Jeff Immelt, said the new businesses his company is creating by digitally connecting its industrial products to customers' operations is "the most important thing [CEOs are] going to work on, at least in this era."⁶³ He warned CEOs who fail to invest in this area do so at their own peril.

By intimately understanding how customers use their products, manufacturers are now able to make big improvements in the customer experience. In particular, they can shift from reactive, break-fix services, to predictive services that help prevent their products from breaking in the first place. For example, electric car maker Tesla received a recall notice in 2014 from the U.S. National Highway Traffic Safety Administration. Tesla was able to fix over 22,000 cars without assuming the expense of a multimillion-dollar recall—and without inconveniencing its customers by forcing them to drive to dealers to drop off their cars.

How did Tesla do it? Simply by wirelessly releasing a software patch to the cars.⁶⁴ As Caterpillar CEO Doug Oberhelman says, "Our business model runs on uptime for customers. If we run at a lower cost than our competition, we win."⁶⁵ In this instance, Tesla won.

The manufacturer-customer connection, enabled by digitalization, is especially critical to manufacturers beset by commoditization. By adding digital services to products, they can create new revenue streams and differentiate themselves and their products. For many manufacturers, this digitalization lets them shift from being just a maker and distributor, to also providing service to customers, whether they are other businesses or consumers. Some manufacturers hope to move from a 90-10 product-service ratio to 50-50, to increase margins and develop recurring revenue streams.⁶⁶

⁶³ GE's Jeff Immelt on Digitizing in the Industrial Space, October 2015, accessed May 18, 2017, <http://www.mckinsey.com/business-functions/organization/our-insights/ges-jeff-immelt-on-digitizing-in-the-industrial-space>

⁶⁴ Wired, Tesla's Over-the-Air Fix: Best Example Yet of the Internet of Things?, February 2014, accessed May 18, 2017, <https://www.wired.com/insights/2014/02/teslas-air-fix-best-example-yet-internet-things/>

⁶⁵ Caterpillar and the Internet of Big Things, October 15, 2015, accessed May 18, 2017, <http://www.caterpillar.com/en/news/caterpillarNews/innovation/caterpillar-disrupted.html>

⁶⁶ TCS, Servitization in Manufacturing – The Final Frontier, Dec. 2016, accessed May 18, 2017, <https://www.tcs.com/content/dam/tcs/pdf/Industries/manufacturing/abstract/Servitization-in-Manufacturing-the-final-frontier.pdf>



A manufacturer must gain a 360-degree view of its customers throughout the lifecycle in which they use its products.

To make this transformation, a manufacturer must gain a 360-degree view of its customers throughout the lifecycle in which they use its products. This is far different from a transactional snapshot retrieved when the product is sold, serviced, and returned. It requires shifting the focus from upfront product sales revenue to lifetime revenue from customers.

By having a continuous data stream flowing into its systems, a manufacturer can tailor its products to how customers use them. It can also allow customers to customize the product and how they use it. For example, when GE monitored how its engines on Alitalia planes were consuming fuel, the Italian airline changed the wing flap positions in landings. This reduced fuel use and, of course, Alitalia's costs. It was mutually beneficial for both companies, and was made possible by the continuous digital monitoring that creates a more-than-transactional relationship.⁶⁷

Such customer product usage data will ultimately give the manufacturers that possess it something their competitors do not have: insight into what other products and services the customer will need. And that will produce more than new product and revenue opportunities. It will allow manufacturers to charge a premium (even for commoditized goods) and, more importantly, provide an enduring competitive advantage.

⁶⁷ Harvard Business Review, How Smart, Connected Products Are Transforming Competition, November 2014, accessed June 6, 2017, <https://hbr.org/2014/11/how-smart-connected-products-are-transforming-competition>

How Manufacturers Can Get from Here (Today) to There (Tomorrow)

To gain this competitive advantage through digitalization, manufacturers must begin by developing an overarching business strategy because they must change their business model. They have to think hard about how to create and maintain that competitive advantage over time.

Many services a company rolls out can—and will—be quickly copied by competitors. Consequently, executives must think about developing products to which they can add features continuously. At the same time, they must simplify and lower the cost of the business processes that provide the services attached to those products. Digitalization has a great potential to reduce cost of operations and build trust with customers through transparent and real-time visibility in sales and service.

Manufacturers have key choices to make here. One is whether to sell a product or maintain ownership and sell the product as a service (i.e., servitization), charging only for the use of the asset. This is becoming the case not only with end products but also components

of a product or system—for example, airplane engines (as power by the hour) and truck tires (as Michelin now does, charging fleet owners a per-kilometer rate).⁶⁸ Indeed, some manufacturers believe after-sale transactions may be more profitable than the sale of the product itself. They're launching services for repair and troubleshooting their products, and selling follow-on products and services (such as updated GPS mapping systems for automobiles).

Another choice that manufacturers have here is about the channels for connecting with customers. Traditionally, many manufacturers sold and serviced their products through distributors and dealers. But today's digital portals let manufacturers connect directly to end customers.

If its strategy is one of servitization, then a manufacturer must keep a rich digital connection to the products that are in customers' hands. If it can continually monitor the condition of its products, a manufacturer can develop a more detailed and accurate picture of how to price its support services and warranties.

⁶⁸ *Monetizing Innovation*, Madhavan Ramanujam and Georg Tacke, Wiley, 2016, pp. 81-82



Your business strategy must also determine how much income your company can retrieve—not on a quarterly basis, but over an extended period. Generally, the higher the value of the product (such as aircraft engines and luxury cars), the greater the opportunity for after-sale profits derived from digital connectivity.

Several car insurance companies are tracking their customers' driving behaviors to more precisely price the policies they offer and sell additional features. Indeed, the number of drivers now enrolled in pay-how-you-drive programs has doubled since 2013. Progressive, one of America's largest car insurers, has 4 million usage-based customers. Its policies are based on telematic technologies that use machine learning algorithms. Such insurers can adjust premiums on an almost real-time basis, which benefits them (by reducing their risks) and their better-driving customers (who pay less).⁶⁹

Your business strategy must also determine how much income your company can retrieve—not on a quarterly basis, but over an extended period. Generally, the higher the value of the product (such as aircraft engines and luxury cars), the greater the opportunity for after-sale profits derived from digital connectivity. Lower-value products—think coffee makers, toasters, and barbecue grills—have shorter product lifecycles. They are more likely to be replaced than repaired. They, therefore, will have a lower return on digital investment.

That said, IoT enables manufacturers of all products to make money on them after the sale. The question is not if, but where they can make money.

Importantly, manufacturers must develop infrastructure and partner ecosystems capable of collecting and analyzing the volumes of digital data coming from the field. Most manufacturers are still aggregating data above the local field level. However, few companies outside the energy industry collect information on a

⁶⁹ 3 Reasons Insurers Are Moving to Behavior-Based Insurance, May 25, 2016, accessed June 6, 2017, <https://gotruemotion.com/3-reasons-why-insurers-are-moving-to-behavior-based-insurance/>

customer-by-customer basis. That data is still owned primarily by retailers and channel partners (if they have robust CRM systems).

That's why it's so important for manufacturers to be transparent with their channel and distribution partners. To get their data, you must share your own. That may mean sharing leads with distributors and/or developing robust communication pathways to exchange product maintenance information.

Finally, manufacturers need to change their corporate mindsets from product purveyors to service providers. This means focusing investments on marketing, sales, and, above all, customer relations. From a financial perspective, shifting revenue from immediate sales to service and product usage over time must be modeled carefully. Key performance metrics need to be customer-focused (e.g., customer satisfaction measures and customer lifetime value) rather than sales volume and one-time sales revenue.

Your core service mindset must be about helping the customer use and get value from your products. The R&D function must also become customer-centric. It must examine product features through the customer's lens, looking at enhancements that will improve the customer experience rather than adding the next new cool feature that customers may neither value nor be willing to pay for.

A New Business Era

One doesn't need a crystal ball to see that the future of manufacturing lies in developing digitally connected products that continually report back to the companies that made them (or to the retailer that sold them).

That's why using IoT technologies to improve the customer experience after the customer takes possession of a product is now so critical to the future of many manufacturers.