
When Big Data Meets Manufacturing



By Stephen E. Chick , Serguei Netessine, INSEAD Professors of Technology and Operations Management and Arnd Huchzermeier, Chaired Professor of Production Management at WHU-Otto Beisheim School of Management

Developed market manufacturers can't compete on price or lean management anymore. The winners are finding ways to lock in customers with collaborative, data-driven services and activities.

China is no longer only the world's toy-maker : manufacturing there is taking on an increasingly sophisticated flavour. Take **battery maker BYD** or **medical equipment maker Mindray** as examples of companies that have combined low labour costs with high international quality standards and the ability to produce differentiated products on a large scale.

Manufacturers in developed markets have often resorted to cost cutting or alternatively to lean production to keep up. But as such practices become more widespread, there is little differentiation in cost and quality of goods produced in places such as Europe. This means it's easy for customers to change supplier.

But some manufactures have managed to halt this trend. The **Industrial Excellence Award** (IEA) has been run for 19 years in France and Germany by a team of colleagues at INSEAD and WHU, and more recently in Spain, Benelux and the UK over the past few years with academic partners IESE, Erasmus and the Judge School. As judges of the annual research study and award programme, we've noticed some common success factors among the winners. We outline some of those here.

The cutting edge

The concept of partnership may seem like a simple one, but the way the winners are managing their partnerships is what is giving them the edge. They're doing this in a variety of ways. Firstly, they leverage data to integrate closely with their supply chain partners. Secondly, they optimise customer value across the entire chain. Thirdly, they cooperate with suppliers to improve processes. And fourth, they leverage their technical capabilities to offer customisation to customers.

Co-creation with data drives loyalty

As we saw in **last year's IEA awards**, companies that had found ways to link information flows between themselves and the customer, a buyer-seller relationship became co-creation fed by trust and loyalty supported by transparency. With such information-based integration, suppliers are able to embed themselves in the customers' ecosystems.

Water meter manufacturer Itron uses such information flows to make itself indispensable to its customers. The company has developed water metering systems which can be read remotely so that it can provide "smart grid" solutions, whereby municipalities can identify water consumption patterns and even leakages to reduce response time and provide a smooth service. The system also supports billing, support and analysis of consumption habits.



Schmitz Cargobull, a German truck body and trailer maker uses telematics (telecommunications and data) to monitor the maintenance, cargo weights and temperatures, and routes travelled by any of its trailers. This helps customers to better manage usage and minimise breakdowns.

A plant in the energy production equipment sector is innovating by sharing production information in real time with its clients as a service to help their clients, municipal and large scale commercial developers. In effect, this improves the clients abilities to manage contingencies in their complex project planning activities.

Value across the chain

Smart manufacturers know that there are other ways in which they can create value for customers; they don't need to base their value proposition solely on the product. Take Spanish firm Orkli, the world leader in heating control systems for homes and businesses, a worker-owned company in a rapidly changing industry that has developed from simple thermostats to digital climate control and solar heating systems. By analysing the client's heating history and future needs, the company is able to recommend newer, more cost-efficient technologies.

José Luis Pérez, the company's president, says the additional effort to fulfill customer needs actually allows the Spanish company to “exceed customers’ expectations”. Orkli has onsite-R&D teams and even foots the bill on many projects. “Sometimes we have to go to our customers with proposals that they are not asking for,” he explains. “And proposals that are new for them, that they don't [even] know they need. But after showing them this proposal, they can say, ‘okay, this would be good for me.’” Orkli was awarded the 2013 Spanish Industrial Excellence Award.

Technip, a producer of subsea flexible pipes for the oil and gas industry has found innovative ways to add value to customers. Its traditional services include installing, inspecting, maintaining and repairing pipes in locations around the world. The company, however, goes further. In collaboration with oil field services company, Schlumberger, it has developed intelligent pipes that can monitor and regulate the temperature throughout an oil pipeline. This helps to reduce complexity in sub-sea drilling layouts and shortens installation times for customers.

Cooperative innovation

BMW, which was named the overall European winner in [last year's IEA Awards](#) for its Leipzig factory, has found ways to optimise production for maximum flexibility. The site



includes multiple suppliers which coordinate on site. And workers in the Leipzig plant are given and assume a great deal of responsibility for continuous improvement and even scheduling of work tasks which are often the purview of management in other firms.

BMW's exterior plastics department in Landshut, Germany transformed itself in two years from an in-house supplier of molded plastic parts to a supplier of entire chassis. This has been achieved by a few good moves. Firstly, the purchasing function is collocated with the manufacturing unit. This allows for research funds to be quickly disbursed, developing new production methods, piloting new manufacturing facilities and disseminating process improvements. This means a more frequent exchange of ideas around technology and faster innovation cycles. This motivates suppliers to provide on-time delivery and exceptional quality. The plastics unit also supports collaboration with suppliers by offering them a range of services that help them to adapt their ideas and innovations.

Customisation approach

Customisation is an area that requires a high level of knowledge and skill in product design. Factories able to offer higher degrees of customisation and maintain their quality truly have a leading edge. Stiplastics exemplifies this spirit.

Stiplastics was a contract manufacturer in the highly competitive plastics injection moulding sector. Through time it has reinvented itself by focusing on health solutions which build on its expertise in plastics materials. Some of those solutions are for business-to-consumer (B2C) solutions which are marketed directly or through pharmacies. One such product involves the use of design thinking to develop fashionable pill containers with the goal of supporting compliance to medical treatment in a dignified way. Other products involve collaborations with the pharmaceutical industry for plastic products which are designed to make the delivery of medication safer.

BuS Elektronik, an extremely flexible producer of small and medium-sized electronics components and systems, provides another example. The company's customers, original-equipment manufacturers, give BuS independence in production design, perhaps presenting them with a product idea or particular performance specification. As the design team is highly motivated by a profit sharing scheme, all products are designed to simplify

the assembly process and reduce labour inputs. It also keeps up to 20 percent of facilities idle, to enable flexibility in the production process.

As we've seen across these examples and many others over the years at the Industrial Excellence Awards, manufacturers that have found ways to leverage data to optimise their own and their customers processes have propelled themselves to new levels of success. A highly collaborative and open nature of customer and supplier interactions has also been a key differentiator.

If your plant would like to participate in the Industrial Excellence Award and research study, please visit the web site <http://industrial-excellence-award.eu/>.



Serguei Netessine is Professor of Technology and Operations Management at INSEAD. He is also The Timken Chaired Professor of Global Technology and Innovation and Research Director of the [INSEAD-Wharton Alliance](#).



Stephen Chick is a Professor of Technology and Operations Management at INSEAD, and holds the Novartis Chair of Healthcare Management.



Arnd Huchzermeier is Chaired Professor of Production Management at WHU-Otto Beisheim School of Management, and director of the IEA for Germany.

Follow INSEAD Knowledge on [Twitter](#) and [Facebook](#)

Find article at

<https://knowledge.insead.edu/operations/when-big-data-meets-manufacturing>

About the author(s)

Stephen E. Chick is a Professor of Technology and Operations Management at INSEAD.