

The State of Manufacturing Technology in 2016... and Beyond

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(IW - Kimberly Knickle: 1-8-16) As an industry, manufacturing is “hot.” Regions are creating manufacturing initiatives, countries are creating policies to lure manufacturing back and prepare the next generation of talent, maker fairs show entrepreneurs and small-scale artisans how they too can design and manufacture their own products, what manufacturers sell goes well beyond the 100-year-old recipe and the mechanical drawings, and new technologies are changing the economies of scale so that large- and small-scale value chains can be successful.

Worldwide manufacturers will spend an estimated \$323 billion on external IT expenditures, according to IDC’s Pivot Table: Worldwide Manufacturing IT Spending Guide, Version 2, 2013-2018. All of this change means that IT is increasingly an integral part of manufacturing’s success and we’re on our way to a digital transformation.

Our predictions span topics that are relevant across the entire company, in the plant operations, engineering and R&D, supply chain planning and execution, and service delivery. Key themes relate to customer engagement and customer service, supply chain modernization to support evolving market requirements and manufacturers’ “need for speed,” the fundamental nature of innovation in processes, products and services, and the fact is it isn’t enough just to have technology—companies must work to create value from their investments and have the right talent. And most importantly, the rapid adoption of new technologies and innovation accelerators is changing business models.

I’d like to set the stage with some background, essentially a few of the drivers or expectations behind manufacturers’ business priorities, IT initiatives and the predictions we share below. Our first driver is digital business transformation (DX)

(see graphic at the top of the page) and the fact that manufacturers are applying and must apply third-platform technologies and innovation accelerators to enable DX. In our graphic, you can see the core technologies that includes, from Big Data and analytics to next generation security. For manufacturers, DX is changing the way manufacturers design, make and deliver products and services, as well as how they define those products and services.

Our second key driver is cyber-IQ, combining technologies such as the Internet of Things (IoT) and cognitive with massive datasets and advanced analytics and improving the way people and machines interact. In the manufacturing industry, this impacts everyday work and processes in our organizations as well as connections to suppliers and customers.

A couple of our drivers relate to manufacturers' dynamic business environment, including the way geographic regions increase competition, add customer complexity and operating challenges. Regional variations above and beyond cost will continue to factor into many manufacturing decisions—for example, which markets are emerging, where the best talent is located, and which factors are most relevant when selecting a new location for a plant.

Similarly, change in the value chain is also a factor in our predictions. Regardless of how vertically integrated manufacturers are, they've always recognized the success of their products in the market is based on their ability to cooperate and collaborate as a network. In some manufacturing industry segments, OEMs are increasingly relying on Tier 1 or even Tier 2 suppliers for innovation or cost savings, with mixed results.

Similarly, manufacturers across all industry segments are putting more information and influence in the hands of their customers. This elevates the requirement for collaboration, communication and coordination in a secure, organized and resilient manner.

Two of our drivers are about key assets—information assets and the workforce. IDC estimates the digital universe is growing at 40% per year, and will reach 44ZB, or 44 trillion gigabytes by 2020. The challenge is to exploit information as an asset that can fuel digital transformation—to create new efficiencies or generate new revenue

streams. Information must be usable for analysis and in turn analyzed; this will provide manufacturers with visibility into the actual product performance and create a foundation for continuous improvement and new products and services.

In the workforce, manufacturers have long-time, experienced workers close to retirement and a new generation of tech-savvy workers; knowledge is leaving the organization, and new ways of working are entering the organization. There are an increasing number of manufacturers without the talent and workers they need in their factories, supply chains, engineering, and research and development. As a result, manufacturers are embedding tech into everyday work life, to help their employees do their jobs—manage their operations, design products and develop new intellectual property from anywhere in the world and more easily access critical work-related information from anywhere.

And our final driver is about business-relevant security, spanning cyber and physical security across IT and OT (operations technology). In addition to securing data centers, networks, transactional systems, customer data and engineering designs, the convergence of IT and OT and the addition of sensor data on connected assets, products and supply chains are changing the security roadmap. An integrated approach to security will also account for sensors, supervisory control and data acquisition (SCADA), GIS, GPS, data historians. Really a mix of IT and OT, or a mix of what's traditionally on the network and what's just getting onto the network.

Top 10 Manufacturing Predictions for 2016

With that introduction, let me share our predictions for 2016:

1. The Impact of Customer Centricity: By the end of 2017, those manufacturers that have leveraged customer-centricity investments will gain market share growth in the range of 2-3 percentage points.
2. Global Standards for Global Manufacturers: In 2016, 90% of manufacturers will impose their global standards on all operations, including outsourced operations and suppliers, to decrease risk and increase market opportunities.
3. Value Realization: By the end of 2016, 65% of manufacturers will have metrics in place to evaluate and drive pervasive changes in the workplace with their new technology investments.

4. Building on IoT-enabled Products and Processes. By 2019, 75% of manufacturing value chains will undergo an operating model transformation with digitally connected processes that improve responsiveness and productivity by 15%.
- 5: Redefining Modern Supply Chain Logistics. By 2019, 50% of manufacturers will have modernized their logistics network to leverage 3-D printing, robotics and cognitive computing to support innovative postponement strategies.
- 6: The Decline of Short-Term Forecasting. By the end of 2019, enterprise-wide improvements in resiliency and visibility will render short-term forecasting moot for 50% of all consumer products manufacturers and 25% of all others.
- 7: Enterprise Quality via the Product Innovation Platform. By 2018, 60% of top 100 global manufacturers will be using a product innovation platform approach to drive enterprise quality throughout the product and service lifecycles.
- 8: The Digital Twin. By 2017, 40% of large manufacturers will use virtual simulation to model their products, manufacturing processes, and service delivery to optimize product and service innovation.
- 9: Smart Manufacturing with Cloud, Mobile, and Big Data and Analytics. By the end of 2017, 50% of manufacturers will exploit the synergy of cloud, mobility, and advanced analytics to facilitate innovative, integrated ways of working on the shop floor.
- 10: IT Transformation for Digitally Executed Manufacturing. In 2016, 20% of manufacturers will begin to break down organizational silos, reshape IT portfolios, and import new IT talent in the plant for digitally executed manufacturing.

New technologies and enhancements are necessary to achieve the digital transformation required for the next generation of manufacturing. Manufacturers must review their current application portfolio; modernize processes in the back office and the plant, and in all aspects of the value chain upstream and downstream; and upgrade their decision-making capabilities.

Consider the following to ensure you maximize the value from current and future technology investments:

- Help your IT talent learn new technologies and better understand the needs of their business customers.
- Ensure that IT and line of business are collaborating as true partners in the

selection and implementation of new technology.

- Consider how your investments in IT and operational technologies can lead to business transformation, not just incremental improvements.
- Look to your employees and customers for innovative ideas for the use of new technology and best practices in terms of implementation and use.
- Work with partners to accelerate your IT capabilities and serve the line of business. As you embed more technology in how you operate, external resources and expertise can help you move quickly and effectively.

2016 promises to be an exciting year for those manufacturers that can move forward on their digital transformation journey.

(Kimberly Knickle is research vice president of IDC Manufacturing Insights.)