

Manufacturing Trends to Watch in 2016

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(Manufacturing Leadership: 1-5-16) As the New Year begins, the editorial team at the Manufacturing Leadership Council offers 12 business and technology predictions for the year ahead. Included are predictions about global manufacturing growth, the adoption of Manufacturing 4.0 concepts and technologies, manufacturing skills sets, cybersecurity, smart products, and how the subject of manufacturing might fare in the U.S. presidential election campaign.

Global Manufacturing to Grow Modestly: Economists and governmental organizations are predicting respectable industrial growth in 2016, assuming that there are no disruptive political or economic events. A 2.6% growth rate is foreseen in the U.S. China and India, although currently in contraction, are seen as faring better, with 6% growth predicted in China and as much as 8% growth foreseen for India. With its economy continuing to recover, European manufacturing growth, while uneven country by country, is expected to grow faster than the U.S. The yet-unknowns: the migrant crisis in Europe, the global threat of ISIS terrorism, and the possibility of more sophisticated cyberattacks, any of which could upset business conditions and damage growth.

U.S. Election Year Blues: Despite a rise in state-sponsored manufacturing competition from countries such as China and India, U.S. manufacturing will struggle for visibility during the U.S. Presidential election year as terrorism, immigration, and rising income inequality, among other topics, dominate the national political debate. None of the major candidates from either political party have demonstrated knowledge of or a focus on manufacturing. The one bright spot: the selection of the U.S. as the partner country at the world's largest industrial event, the Hannover Fair, in April in Germany. And the participation of President Obama, the first time a sitting U.S. president will be in attendance at the Fair.

Manufacturing 4.0 In Action: 2016 will be the year when the much-vaunted theories behind Manufacturing / Industry 4.0 that have been developed over the last few years move into real-life practice as front-line use cases begin to bring to life the

opportunities for applying advanced new digital, cyber-physical approaches to plant floor automation and processes to significantly improve manufacturing productivity, flexibility, quality and efficiency. Companies that can serve as role models for others will emerge. And end-user demands for interconnectivity and software standards will intensify.

Small Manufacturers to Fight the 'Digital Divide': Concerned that they could fall rapidly behind global competitors with greater financial and other resources, small- and medium-size manufacturing companies will move more aggressively to develop strategies to embrace Manufacturing 4.0 concepts and technologies. For many, this will include modernizing plant floor equipment and moving to state-of-the-art operational systems, including cloud-based ERP systems, to better manage information.

The Rise of the Chief Digital Officer: Many manufacturers will begin to realize that current siloed organizational roles are inadequate for the new digital era of manufacturing and will appoint specific executives with the cross-functional power to drive digital transformation across the enterprise. Chief Digital Officers will not only be silo-breaking evangelists of the new digital age, but will actively lead initiatives to help create end-to-end 'Digital Threads' that stretch from the supply chain, to production sites, to the development and deployment of smarter products.

IoT Drives New Smart Business Models: Internet of Things (IoT) technologies will be everywhere this year — from the tools you use, to the products you make, to the devices you wear. This digital pervasiveness will drive the creation of new, smart business models for manufacturers built around embedded connectivity, big data, advanced analytics, and new data-driven services. Such services will not only be single-company or product based, but will also begin to emerge as disruptive, collaborative, shared industry platforms in areas such as healthcare and transportation.

'Smart Products' Value More Clearly Identified: Manufacturers will push not just to design and connect more smart products, but increasingly they will seek to secure and monetize those smart platforms. Having connected the majority of their new models, auto manufacturers, for example, will dig deeper to understand the unique value that they can deliver through these smart platforms as they seek to differentiate themselves from device providers such as Google and Apple who are planning to enter the automotive space.

New Technologies Will Push Boundaries: A host of advanced technologies – collaborative robots, 3D printing, simulation, augmented reality, cloud-based software systems, to name a few – will gain a greater share of mind among manufacturers as many embark on the journey to Manufacturing 4.0. The year 2016 will be one of intense information gathering and education as manufacturers seek to understand how they can apply these technologies to their own operations, what the business case can be, how to identify and select suppliers, and how these technologies will re-shape their organizations, skills inventories, and work patterns.

Robots Get Collaborative: Among the advanced technologies manufacturers will increasingly embrace, the flurry of announcements last year around more affordable robots that can work safely alongside human employees in collaborative ways will begin to transform many plant floor working environments in the year ahead. Heuristic capabilities based on visual analysis and machine learning will make these collaborative robots easier to program for intricate tasks, more flexible in the variety of jobs they can perform, and easier to deploy in front-line manufacturing roles. Labor issues may hinder deployment in some cases, but the overall adoption trend will be unstoppable. At the same time, more affordable general-purpose robots will be increasingly adopted by small- and medium-size manufacturers.

3D Printing to Gain Ground: Also among the advanced technologies is 3D printing, which will continue to challenge traditional production models. Consumers will adopt personalized 3D printing for self-printed clothing, parts, and household items, while businesses will acquire them to aid in the production of their products and product parts. Further innovations, including quality improvements, to enable 3D printers to use metals and other materials more effectively will drive demand for the machines in the aerospace, medical, and automotive sectors.

Cybersecurity Becomes More Formalized: Manufacturers of all sizes will increasingly be expected to demonstrate that they have put in place the state-of-the-art technologies and internal processes needed to protect their plants, intellectual property, supply chains, and customers from cybersecurity vulnerabilities. Much of the push for security audits and documentation will come from industrial customers. But regulators such as the SEC will also get in on the act, requiring that manufacturers prove that they have mitigated the kinds of security threats that could have profound financial impacts.

Skill Sets Will Be Rethought: As digitization increasingly demands a much more

integrated, agile, and responsive organization, manufacturers will rethink the backgrounds and skill sets required of contributors up and down the corporate structure. On the plant floor, manufacturers will seek out and encourage workers with strong communication and collaboration skills and who are comfortable with new technologies. Meanwhile, in leadership ranks, manufacturers will value those who can cultivate engagement and exert their positive influence across functional boundaries.

Better Demand Planning Emerges: As demand continues to fluctuate unpredictably—particularly in markets such as Europe and China—manufacturers will create more agile, demand-driven planning processes, replacing traditional but increasingly inaccurate push-based forecasting models that are based on historical patterns. This will require manufacturers to accelerate the digitization of existing processes, break down internal functional silos, and vastly improve collaboration and communication with supply and demand chain partners.

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