# The future of manufacturing lies in IoT investment

By Mike Vincent   11 Jul 2017

Manufacturing today is no longer simply about making physical products but about finding new ways to create and capture value for the end user. Changes in consumer demand, the nature of products, the economics of production and the economics of the value chain have led to major shifts in the way goods are designed, produced and sold. Increasingly customers who are spoilt for choice are demanding personalisation and customisation, almost blurring the line between consumer and creator.
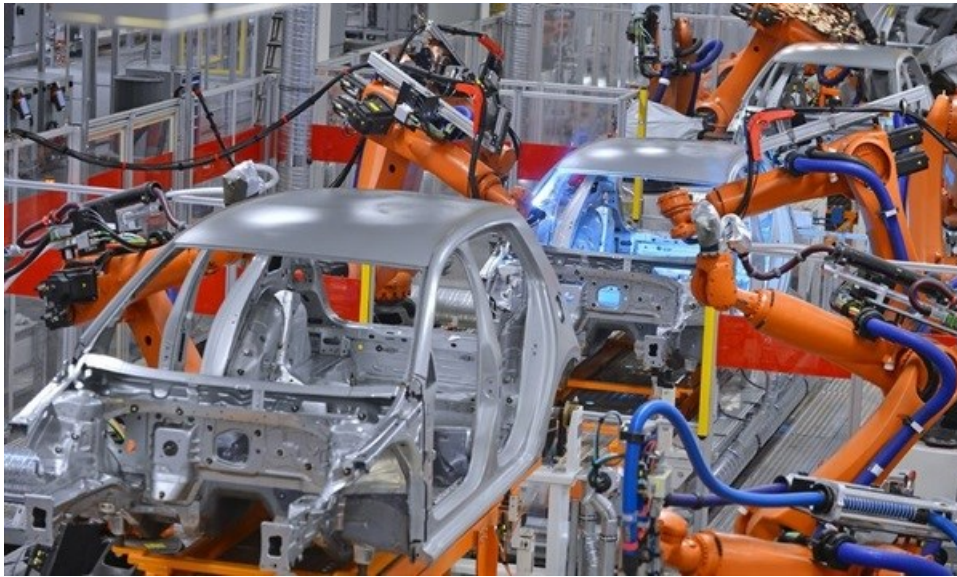
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The changes come on multiple fronts, one being advanced manufacturing – in the form of additive manufacturing. Advanced materials, smart, automated machines and other technologies are ushering in a new age of physical production. At the same time, increased connectivity and ever more sophisticated data-gathering and analytics capabilities enabled by the Internet of Things (IoT) have led to a shift toward an information-based economy.

As technology continues to advance exponentially, barriers to entry, commercialisation and learning are eroding. New market entrants with access to new tools can operate at a much smaller scale, enabling them to create offerings once the sole province of major incumbents.

While large-scale production will always dominate some segments of the value chain, innovative manufacturing models – distributed small-scale local manufacturing, loosely coupled manufacturing ecosystems, and agile manufacturing – are arising to take advantage of these new opportunities. Manufacturers are waking up to possibilities such as these and, in the process, starting to transform the way they do business.

Industry 4.0 and IoT central to manufacturing transformation
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Indeed, in the race to find new ways to create and capture value, their smaller size and agility may give many market entrants an advantage over larger, older organisations, if only because incumbents may find it difficult to change entrenched business models and practices to accommodate new marketplace realities. Moreover, the new entrants are not

necessarily even manufacturing companies in the traditional sense.

Industry 4.0 implementation challenges

Manufacturers who want to compete successfully on a global scale should be increasing their investment in IoT infrastructure or they will run the risk of becoming redundant in an increasingly global village. There are precautionary measures to consider for companies implementing or planning to implement Industry 4.0 practices. Most of the challenges relate to the management and integration of Information Technology (IT) and Operational Technology (OT).

While some have an organisation-level impact, other challenges exist at the broader, ecosystem level. These challenges are heightened as connected technologies evolve at a rapid pace. The challenges include:

• **Talent and workforce:** In the process of trying to integrate IT and OT through the use of Industry 4.0 practices at the organisation level, companies often face a shortage of talent to plan, execute, and maintain new systems. The challenge extends to the shop floor as with vast experience in conventional manufacturing, many leaders feel uncomfortable with advanced manufacturing. They simply have less experience with the properties and behaviour of materials, as well as the technologies and methodologies that use them.

Standards and interoperability: From a broader, ecosystem-wide perspective, many of the systems underpinning Industry 4.0 applications are proprietary and can present integration challenges. A lack of interoperability poses a significant challenge for full adoption of Industry 4.0 technologies.

• **Data ownership and control:** As more stakeholders across the value chain become connected, questions will arise within the ecosystem regarding who owns the data generated and how to ensure appropriate privacy, control, and security. These questions grow thornier as suppliers and manufacturers become increasingly intertwined. Suppliers and vendors throughout the supply chain right up to end-use retailers and customers could potentially stake a claim on the data generated within their particular sphere, and perhaps even beyond.

• **Security:** Security-power tradeoff becomes more important as deployments scale. Retrofitting old systems to new Industry 4.0 applications may also increase security risks, as the old systems were not designed to be connected in this way. In order to manage security risks, companies need to secure their systems, be vigilant to avoid new risks, and be resilient to limit the damage and restore operations.

Effective use of information can, in turn, impact key business objectives such as business growth and business operations, and transformation can be possible across the value chain and its various stakeholders. The path to realisation of Industry 4.0 involves a clear understanding of the ways in which the physical can inform the digital, and vice versa.

ABOUT THE AUTHOR

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