Smarter Operations: The Value Chain's Vital Role in Digital Evolution

Chapter 1

The Disruptions Shaping Manufacturing and How to Catch Up



Smarter Operations: The Value Chain's Vital Role in Digital Evolution

A four-part series helping manufacturers make progress today while building for tomorrow

Modern digital technology is transforming every industry, including manufacturing. Yet in *The Rise of Smart Operations*, a survey of machinery manufacturers conducted by UPS and IDC, roughly one-half of the respondents said their digital or "smart" operations were lagging the competition or were at a significant disadvantage. This four-part series continues to explore the building blocks required to create a smarter, more digital operation. Manufacturers will also find practical solutions they can consider implementing today to incorporate smarter operations in their production processes of the future.

Concepts

Thought leaders envisioning the digital future of manufacturing production have put names to different movements or strategies. For consistency, the following definitions are being applied.

Digital Transformation (DX)

Technology analyst and advisory firm IDC defines DX as *transforming decision-making with technology*. Manufacturers must look at DX as a mechanism to deliver the next level of value for the organization through the use of digital technologies.

Industry 4.0

This fourth Industrial Revolution is the next wave of disruptive technology that will enable manufacturers to make great leaps in productivity, efficiency and innovation.

Smart Operations

A step forward from Smart Manufacturing to the digital connectivity of machines, facilities and people outside a factory's walls. Smart Operations helps to integrate processes both upstream and downstream to improve visibility, and to enable flexibility to planned and unplanned changes.

Trading Partners

Businesses contributing at any point in the value chain to the manufacture and delivery of products.

Value Chain

The unique internal and external contributors to a manufacturer's end-to-end supply chain that add value to the product being supplied to customers.

Introduction



by Matt Guffey
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The modern manufacturing environment can be characterized as smart, automated, integrated and digital. Yet manufacturers' progress toward each of those characteristics is as varied as the products they make. A 2016 UPS-IDC survey with machinery manufacturers showed that just over 50% thought their operating model was evolving digitally, while only 10% said their business model was fully transformed. In short, the vast majority of manufacturers are in the middle of, or anticipating, many difficult and costly decisions about the future of their operations.

It is here where the value chain can truly live up to its name. Many trading partners — suppliers, service providers, logistics companies, and so on — have already made investments in technology, facilities and expertise that could benefit their manufacturing customers and other value chain partners. Many are doing just that. New business dynamics are taking shape as companies realize they cannot employ or purchase the capabilities needed in an increasingly digital world. Manufacturers are partnering with customers and suppliers in an effort to remain competitive and find disruptive innovation.

Will this spirit of collaboration catch fire? In my opinion, it must. Companies in the digital age will not only benefit from broadening their circle of collaborators, their very survival may depend on it.

In this introductory chapter of *Smarter Operations: The Value Chain's Vital Role in Digital Evolution*, we look at the major forces driving change in the manufacturing process, and offer practical solutions for achieving smarter operations.

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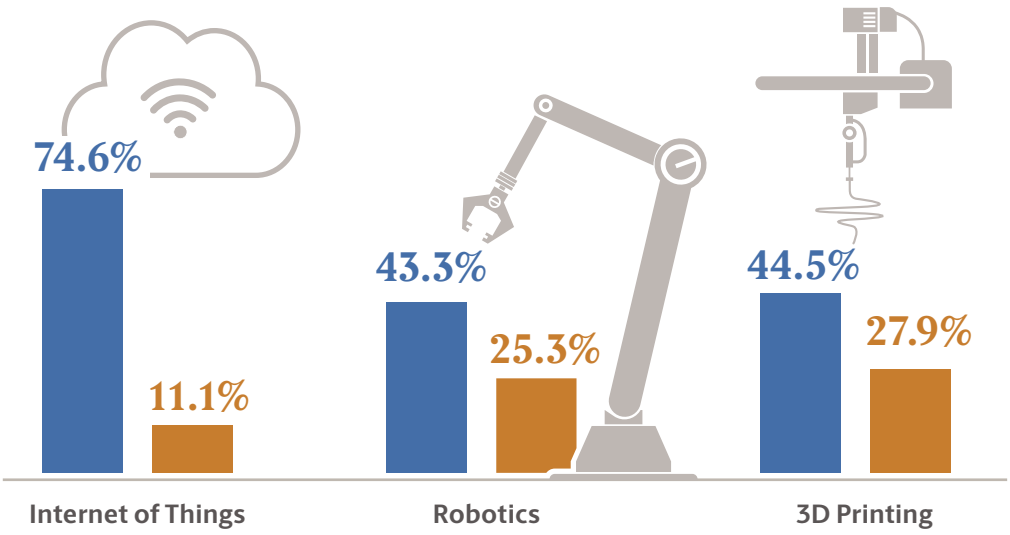
Drivers of Change

Change in many forms is driving manufacturers to rethink strategy, redesign business processes and retool their organization to compete in the modern environment.

Customers are in part driving change with demands for new and improved products, and faster turnarounds, all at a lower cost in order to meet their price pressures.

The changes are also driven by internal factors, such as the shortage of skilled labor, that are creating long-term implications for production of the future. Advances in technology are significantly compensating for labor shortages by increasing productivity through digital transformation (DX) in the manufacturing industry (Figure 1).

Figure 1



Adoption of IoT, Robotics, and 3D Printing in Manufacturing

Which statements best describe your organization's current position for the following technologies and solutions?

Currently evaluating, implementing, or in use Will evaluate in the next 0–3 years

As manufacturers evolve using the modern technology available to them, it is important that they take a holistic approach to process design and technology adoption. Companies must look across the entire value chain to identify where this technology can best be applied, and they must consider how well-positioned they are to help drive the processes forward. If they are not well-positioned in any area, a decision must be made on how to shore-up the specific weakness, whether through internal resources and innovation or third parties.



Current State

Digital transformation (DX), smart operations, and Industry 4.0 have become common discussion points in the manufacturing industry. Their chief commonality is the objective of driving efficiency and productivity in the manufacturing process.

As manufacturers strive to incorporate these operating principles into their daily operations, the risks of testing and learning — while also maintaining continuous and efficient operations — is an ongoing challenge.

However, technology now exists that enables manufacturers to maintain operations as normal while creating a digital copy of the end-to-end process: the digital twin. The digital twin of the manufacturing operation are the virtual digital models of physical assets and processes. Using real world data to understand, evaluate and simulate the end-to-end operation, manufacturers can "see" the potential benefits and pitfalls prior to implementation.

To build the digital twin, manufacturers must be able to capture, communicate and understand data at every point along the value chain. These activities — the basis of a digitally-connected supply chain — comprise the foundation of smart operations.

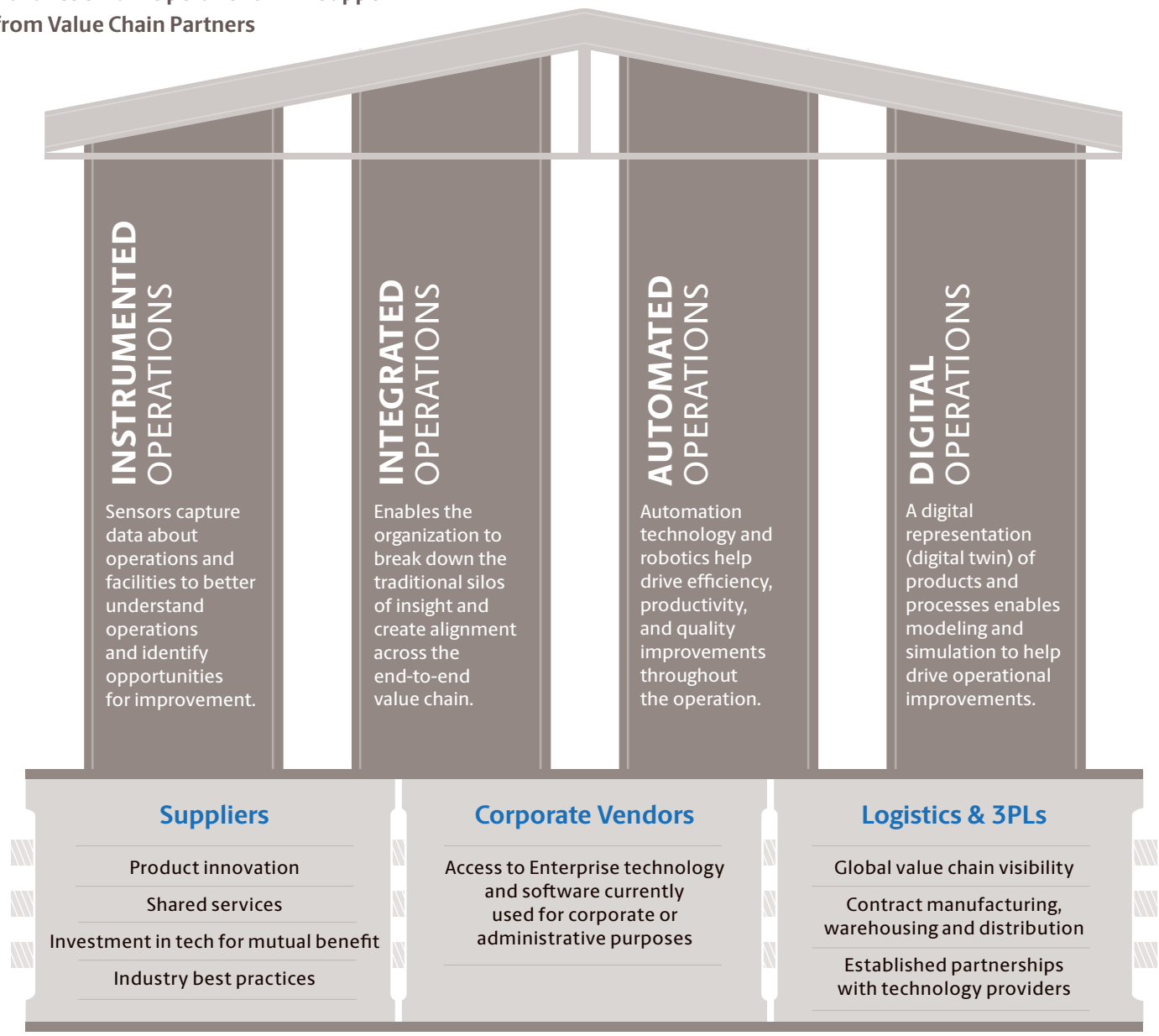
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Four Pillars of Smart Operations

Modern technology is giving manufacturers the tools to become more efficient by creating a digital connection across operations. It is the evolution of technology that is enabling them to engage in digital transformation. Note some of the ways that value chain partners can help supplement and support smarter operations.

Figure 2

Advance Smart Operations with Support from Value Chain Partners



Visualizing the Role of Value Chain Partners

"Innovator" and "disruptor" may be buzzwords, but they are powerful attributes for manufacturers seeking to retain and grow a customer base.

In a fast-moving, technology-driven landscape, few businesses are equipped to transform, innovate and disrupt solely by their own efforts. That new reality also heightens concerns about issues such as intellectual property protections and data security.

The transition into a digital operating world is clearly not an easy one, but absolutely necessary for manufacturers planning to maintain a profitable and growing operation into the future. But the message here is that help is available. The existing expertise and infrastructure in place within the partner network should be investigated as a potential asset to the manufacturing value chain. By working with partners, manufacturers can drive technology improvements, scale up faster, and reduce risk as they build smarter operations into their production processes of the future.

Coming Soon:

Chapter 2 | The Look of Production of the Future
Chapter 3 | The Role of Additive Manufacturing in Production of the Future
Chapter 4 | Production of the Future – Conclusions and Guidance

UPS Logistics Supporting Smarter Operations

Corporate Strategy & Innovation

- Supply chain consultation to help identify short-term and long-term steps toward smarter operations
- Financial and insurance products from UPS Capital to enable growth and investment while mitigating risk

Operations

- Advanced operating capabilities through contract warehousing, distribution and field stocking locations
- Order intake, processing, shipment and delivery
- On-demand Additive Manufacturing (3D Printing) services
- Package Engineering

Inbound/Outbound Logistics

- Integrated global transportation network: ground, air, ocean, rail
- Multimodal visibility into inbound and outbound UPS shipments
- Trade Management and Customs Compliance
- Global Freight Forwarding

Post-Sales Services & Solutions

- Returns solutions to streamline customer experience and better manage inventory utilization and costs
- Test, repair and refurbishment services
- Critical MRO order fulfillment
- 27,000 drop-off and pick-up sites

