



Building Resilient Manufacturing Operations Through Asset Management and IoT

RESEARCH BY:



Stacy Crook
Research Director,
Internet of Things, IDC



Reid Paquin
Research Director,
Manufacturing Insights, IDC

Competition has never been higher in manufacturing, and outside factors can cause major disruptions to operations and supply chains overnight.

Key Stat

\$1.3 trillion has been lost because of COVID-19; the manufacturing industry has borne the greatest impact of those losses by far.

Key Takeaway

Shifting toward a more predictive asset management approach is where the true value is generated and serves as the foundation for resilient manufacturing operations.

In this Spotlight

Introduction	2
Industry Definition and Core Attributes	2
Key Business Priorities	2
Considerations	4
Considering Tech Data as a Supplier of IoT Solutions	5
Takeaways	7
About the Analysts	7
Message from the Sponsor	8

Manufacturers need to make technology investments that address short- and long-term priorities.



Introduction: The Future of Operations Requires Resiliency

While the entire world tries to manage the uncertainty of COVID-19 and its impact, manufacturers, on average, have felt the pressure more than most. In fact, IDC's *Worldwide ICT Spending Guide* has shown that roughly \$1.3 trillion has been lost because of COVID-19, with the manufacturing industry bearing the greatest impact of the crisis by far.

Manufacturers are struggling to respond to supply chain disruption, evolving government/regulatory requirements, and shifting production capabilities to meet public demand for their goods and services. In response, manufacturers are beginning to define their future success by how well they react to market disruptions. They are doing so through a process IDC calls resilient decision making. This process is the combination of ongoing efficiency measures by manufacturers and a new focus on providing employees with near-real-time information, detailed insights on performance, and analytics to improve the decision making process.

Manufacturers recognize that technology will play a key role in their long-term success. IoT in particular will be among the technologies with the greatest impact on the manufacturing industry over the next five years, with roughly half of the industry in the United States already using IoT, either as a pilot or in production. One of the top drivers behind these initiatives is the fact that manufacturers are connecting critical machines and systems where failure can result in expensive downtime or unsafe operating conditions.

Industry Definition and Core Attributes

Manufacturing represents product-centric organizations that can be segmented into two distinct groups.

- **Process manufacturing:**
chemicals, metals, pulp and paper, consumer packaged goods (CPG), food and beverage (F&B), fashion, and life sciences
- **Discrete manufacturing:**
automotive, aerospace and defense (A&D), industrial machinery, electronics, and semiconductor (high tech)

There are unique industry challenges and varying priorities across manufacturing segments, and it is critical to understand these differences. However, while there are many variables across value chains, segments, enterprises, and even individual locations within a company, all manufacturers can benefit by fostering resilient decision making.

Key Business Priorities

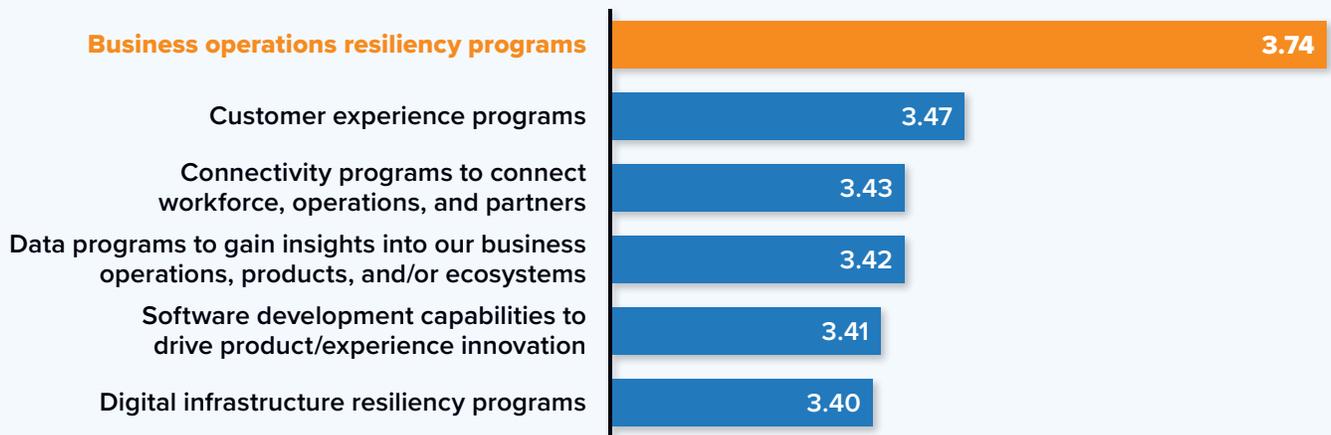
There is no denying the fact that the manufacturing industry will see short-term and long-term changes as the dust settles around COVID-19. The immediate concern for most manufacturers is keeping their employees safe and healthy as operations continue to ramp up. There are a variety of actions that manufacturers are taking to create a safer working environment for their essential employees. This includes the creation of temperature monitoring

checkpoints to ensure that employees arriving to work do not have a fever (a potential precursor for the virus), as well as the introduction of personal protective equipment (PPE) requirements to reduce the likelihood of employees’ contracting or spreading the virus while working. The most advanced manufacturers are turning to video-based systems to monitor the workforce and ensure that social distancing is being followed and that if a positive test does occur, contact tracing can be utilized to identify and isolate employees who could be at risk.

While this increased focus on health and safety is driven by the challenges of a global pandemic, the investments that manufacturers make now will allow them to ensure worker safety from all hazards while improving productivity. From a long-term perspective, the impact of COVID-19 can be seen in the focus on resiliency (Figure 1).

FIGURE 1
Top Manufacturing Priorities as a Result of COVID-19

Q. How much will your organization be prioritizing the following initiatives for 2020/2021?
 (Importance: scale from 1 to 5)



n = 190 | Source: COVID-19 Impact on IT Spending Survey, IDC, May 2020

To accomplish this new priority, manufacturing organizations must develop a data-driven approach to decision making that provides leaders with the information they need to make rapid and effective decisions. Asset management is a core aspect of connected factory operations, and transforming this process through remote monitoring, control, and predictive analytics can serve as the foundation for operational resiliency. Traditional preventative maintenance processes are slow and generally ineffective, but strategic asset management will put

an emphasis on condition-based monitoring and predictive analytics to raise the availability of critical factory assets. Asset management has always been a priority for manufacturers; however, the accelerating deployment of IoT-enabled assets, sensors, and controls have the potential to transform the process. These new IoT data feeds fill the information gaps around asset utilization and performance, which are often caused by manufacturers’ reliance on legacy equipment. It is important to build an asset management road map that includes the broader

infrastructure upgrades needed to support strategic asset management. While there are varying levels of maturity, the majority of the manufacturing industry has plans in place to shift from a break-fix or preventive approach to one that is more predictive and market-driven.

The benefits of shifting to asset management cannot be overlooked and include:

- Increasing mechanical efficiencies by 8–10 percentage points
- Improving asset availability by 20%
- Lowering local maintenance labor costs by 15%–20%
- Increasing spare parts turnover to over 2x
- Achieving a total inventory reduction of greater than 30%

Source: IDC APM end user interviews

Considerations

While IoT can play a key role in the journey to becoming a resilient organization, manufacturers often face challenges in bringing these initiatives to life. These challenges can be technology and/or business-related. In addition, there is the fact that the IoT technology ecosystem includes a complex mix of hardware, software, connectivity, and services vendors—and each vendor may play several roles at once. It can be very difficult to navigate which technology components an organization should buy from which vendor, and then to figure out how those components will work together. These multivendor solutions can also be very difficult to scale, unless integrations have been done between products—and both vendors are committed to the relationship for the long term.

Cost of IoT Projects

In IDC's latest worldwide IoT survey, manufacturers cited cost as the number one challenge holding back or slowing IoT projects within their organizations. For manufacturers, costs can include the need to instrument brownfield equipment with sensors, as well as broader infrastructure upgrades required to

handle the volume of data these sensors will emit. New software may need to be purchased to enable real-time analytics in the cloud and at the edge. In addition, there can be ongoing connectivity charges associated with sending data over wireless networks. Manufacturers will also often engage with services firms to help them integrate various IoT technology components, as well as to integrate their IoT data with existing back-end systems, such as ERP and EAM.

Skills Gap

Another challenge manufacturers face with IoT projects is the issue of skills gaps. In general, manufacturers are facing talent shortages and an aging out of the workforce. In a recent IDC survey, in fact, close to 45% of industrial companies said they were currently understaffed. The three areas they were understaffed in were IT, engineering, and operations—groups critical to carrying out IoT initiatives. Most industries, including manufacturers, are also struggling to find—and pay for—data science talent. Many are relying on third parties for this function due to the scarcity and cost of having these resources in-house. However, data scientists cannot work alone; they have to work with plant engineers who understand operational processes in depth to build the right algorithms for complex machinery. In addition, IT is required to provide the foundation and scale for the project.

Although operational technology (OT) and information technology (IT) used to live within separate groups organizationally, as OT data increasingly gets integrated with IT systems, the people aspect must also be integrated. It is a change management exercise that most industrial organizations will be going through in the near future, if they haven't already. While change is never easy, this process is necessary to ensure that the right organizational structure is in place to support the charter to become a resilient organization.

Data Security

Security is another concern with IoT projects. Operational technology environments have often depended on air gapping—or completely isolating the OT system from other systems (including other internal networks and external networks)—to prevent malicious actors' getting access to these

networks. However, an IoT strategy inherently requires manufacturers to send data that once lived only within the realm of the OT network to other networks, including the internet and/or other internal company networks. Thus, manufacturers must now take a more IT-like approach to security that includes multiple layers of defense. Everything must be protected, from the device to the network to the data to the application. This requires a strong level of visibility into what is connected to the network, the status of those things, where those things are emitting their data, and who gets access to that data.

Considering Tech Data as a Supplier of IoT Solutions

Tech Data is a global provider of technology products, solutions, and services. The company provides channel partners with the expertise and the market reach to help bring their products to market in an efficient way. In the IoT space, Tech Data acts as a solution aggregator, working with a variety of partners to bring comprehensive IoT solutions to market. These solutions span several vertical markets, including industrial verticals such as manufacturing and energy as well as logistics, healthcare, retail, and Smart Cities. In addition to the market-ready solutions Tech Data delivers, the company can also work with partners to develop custom proofs of concepts and solutions.

Tech Data's process to develop repeatable, scalable, market-ready, or custom solutions with partners

and vendors is delivered through a methodology called The Solution Factory (Figure 2).

After this process is completed, the aggregated solution can be included in the Tech Data IoT and Analytics Solution Catalog. Tech Data offers three levels of solutions (referred to as starter, transformer, and accelerator) to partners, based on the technical expertise and industry acumen required to successfully deliver a given offering. The Solution Catalog lowers partners' barriers to entry and speeds their time to market by delivering proven solutions focused on specific business outcomes to fulfill their customers' needs.

The ability for a customer to leverage a pre-integrated and tested solution (or work with a trusted partner to develop one) offers a variety of benefits in terms of speed to market, cost reduction, and risk avoidance. The intensive process Tech Data goes through to ensure that each solution component works well together, can scale over time, and is secure by design is required for any successful IoT project. Customers that leverage these solutions remove the time it would take for them to go through each of these steps themselves with no guarantee of success on the first try. They also remove the cost associated with trial and error and/or developing a solution that fails to scale. Business risk is decreased by relying on a pretested solution, especially one that has been vetted for security throughout.

Tech Data enables partners to sell these solutions using their Practice Builder methodology (Figure 3, next page). Tech Data consultants leverage the methodology to maximize partners' success.

FIGURE 2

Tech Data Solution Factory works with ecosystem partners through the following steps to develop IoT solutions:



FIGURE 3

Tech Data Practice Builder Methodology



**Strategy
development**



**Training and
enablement**



Marketing



Services



**Sales
execution**

The industrial market, and manufacturing in particular, is a key area of focus for Tech Data. The company offers a broad variety of IoT solutions across the entire value chain of manufacturing operations, a sampling of which is provided below.

Brownfield and Closed Equipment Monitoring

This solution allows customers to see the status of critical equipment on the production floor at a glance. A self-service no-code/low-code browser-based customization is offered to set up the monitoring solution quickly. A large library of devices and protocols to connect existing programmable logic controllers (PLCs) or add sensors to equipment is supported. The solution works locally and can connect to a cloud service to monitor multiple production lines or plants, and to aggregate data for more complex analysis and modeling. Leveraging such a solution, customers can increase overall equipment effectiveness and optimize operations.

Video Analytics for Worker Safety

This solution helps manufacturers and industrial companies address the challenge of worker safety by using video to monitor hazardous areas and prevent worker injuries by alerting for unauthorized access. Workplace safety is important not only for ensuring the health and wellness of employees, but also because on-the-job injuries and accidents can be very expensive to deal with and reduce overall productivity.

Smart Manufacturing

The IoT PREDICT solution uses smart sensors to gather vibration, temperature, and power consumption data from the production line to troubleshoot production problems, enable predictive maintenance scheduling, and reduce production downtime. The IoT PREDICT offering securely gathers extensive real-time data from the production floor to help manufacturers reduce downtime, improve overall equipment effectiveness, and deliver cost savings.

Smart Material Handling

This solution makes conveyors intelligent so they can communicate with other conveyors, robots, systems, and people around them. Utilizing rugged edge hardware, it immediately extracts conveyor speed, load, age, and temperature in real time to improve operations and machine longevity and to help create new data-based services revenue. Engineers and other personnel can now obtain real-time alerts and notifications remotely as well as visualize holistic conveyor-system health with user-friendly dashboards.

Advanced Asset Tracking

This solution features an asset management platform that allows organizations to stay connected to their assets 24/7. The visibility the platform provides into asset and equipment fleets enables businesses to improve asset utilization, accelerate turn rates, optimize fleet sizes, and ultimately drive greater customer satisfaction. Additionally, real-time location

updates reduce time spent searching for assets. Instead, customers gain the ability to automate yard checks and track and measure engine run time, time on site, and stops made—leading to more accurate preventive maintenance and usage billing. The insights this solution delivers enable customers to remain nimble and make better decisions across the entire business.

Shifting toward a more predictive asset management approach is where the true value is generated and serves as the foundation for resilient operations. Given the complexity of the IoT ecosystem and the broad amount of skills required to develop and deploy IoT solutions, customers should consider working with a partner that can help them get to market faster, while also reducing the overall risk of IoT projects.

Takeaways

The manufacturing environment is changing faster than ever before. Digital technologies like cloud, mobile, big data/analytics, and IoT are drivers for industry transformation, and companies of every size must embrace these tools. Using IoT to provide real-time data on the status of assets, processes, and people is where most manufacturers start their journey. But the journey does not end there.



ABOUT THE ANALYSTS



Stacy Crook
Research Director,
Internet of Things, IDC

Stacy Crook is a research director with IDC’s IoT Ecosystem and Trends Research Practice. In this role, she provides coverage of key software trends across the IoT landscape, including the platforms organizations leverage to: manage IoT endpoint devices and connectivity; collect, process, visualize, and analyze IoT data; and integrate IoT data into other applications, systems, and services.

[More about Stacy Crook](#)



Reid Paquin
Research Director, Manufacturing
Insights, IDC

Reid Paquin is responsible for the IT Priorities & Strategies (ITP&S) practice. Mr. Paquin’s core research coverage includes IT investments made across the manufacturing industry and manufacturers’ progress with digital transformation. Based on Mr. Paquin’s background covering the manufacturing space, his research also includes an emphasis on the technology enablers that help manufacturing executives make better-informed operational decisions.

[More about Reid Paquin](#)

Message from the Sponsor

Tech Data is the premiere global solutions aggregator of IoT and Data solutions. We strive to accelerate our partners' adoption of next-gen technologies, enable them through a unique value delivery model supported by our Solution Factory, Solution Catalog and Practice Builder™ Methodology, and generate outcome-driven success within Healthcare, Industrial, Retail and Smart Cities verticals.

As the world adapts to the ever-changing landscape spurred by COVID-19, we have crafted a specialized catalog of solutions specifically designed to support customers' growing needs around safety and business resiliency.

Visit our Tech Data Resources page to download our *COVID-19 Response Solution Catalog* and learn how we are helping customers solve for immediate needs around Thermal Temperature Monitoring, Social Distancing, Workplace Safety and more.

[Visit our resources page](#)

IDC Custom Solutions

This publication was produced by IDC Custom Solutions. The opinion, analysis, and research results presented herein are drawn from more detailed research and analysis independently conducted and published by IDC, unless specific vendor sponsorship is noted. IDC Custom Solutions makes IDC content available in a wide range of formats for distribution by various companies. A license to distribute IDC content does not imply endorsement of or opinion about the licensee.

Copyright 2020 IDC. Reproduction is forbidden unless authorized. All rights reserved.