

Competition has never been higher in manufacturing, and outside factors can cause major disruptions overnight. Utilizing data to make effective decisions has never been more important to succeed in this challenging environment.

Building the Foundation for Data-Driven Decision Making in Manufacturing

December 2022

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Introduction

Customer and market expectations for more personalized products, deliveries, and services -- as well as unanticipated events and sudden demand shocks from global disruptions -- are driving change and creating the need for a company to transform how its operations stays aligned with its markets. With disruption being a constant challenge facing the industry, the ability to adapt and change has become even more important. This is resulting in factories being relied upon to handle more complex operations - serving a wider range of products, with faster throughput, smaller lots, all at minimized costs.

In addition, the traditional global economy and competition model is being disrupted, causing manufacturers to rethink their business models to ensure long-term viability. The need to become more consumer centric must become an imperative for manufacturers. Sustainability is also a topic that has been discussed for years across manufacturing. However, rising pressure from governments, regulatory bodies, stakeholders, and consumers has now pushed these initiatives to the forefront for the industry.

IDC defines Digital Transformation (DX) as the application of new technologies to radically change processes, customer experience, and value. DX allows manufacturers to foster innovation and digital disruption rather than enhancing existing technologies and business models. However, the rapid pace of change has led the industry to start defining its future success by how well it can react to market disruptions -- which IDC calls operational resiliency. This is achieved by providing employees with near-real-time information, detailed insights on performance, and analytics to improve the decision-making process.

Manufacturers have encountered many challenges in their efforts to become more resilient, but one of the most cited issues is outdated/legacy infrastructure. Most manufacturers tend to rely upon a mix of plants, assets, and technology systems that are decades old and limited in functionality. Manual or paper-based processes are frequently relied upon

AT A GLANCE

KEY STATS

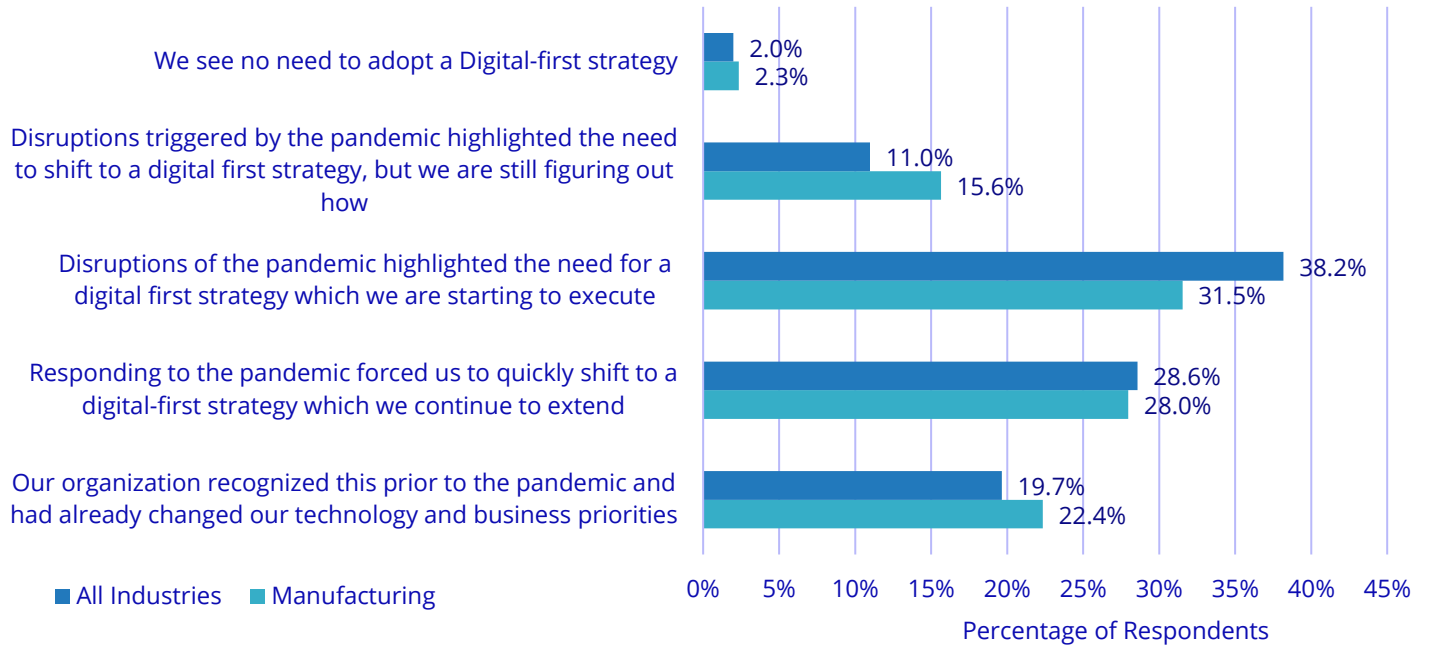
- » Less than 20% of manufacturers believe their business model is future proof, with 30% are taking immediate action to transform and an additional 20% starting within the next 12 months.
- » 91% of organizations rank data as a competitive advantage, but only 24% can extract adequate value from data.

KEY TAKEAWAY

Connecting business processes to eliminate silos and apply analytics to newly expanded and contextualized data removes bottlenecks and empowers workers to make rapid and confident decisions.

and even if data is collected it is often trapped in silos across manufacturing operations. This situation results in information being difficult to access and analyze, hindering the ability to make the most effective decisions in the necessary timeframe. The legacy nature of the industry led to additional challenges when faced with disruption in their operations and across supply chains, even if a company knew how they should react, many lacked the ability to adapt quickly enough. In response, the industry is now embracing a digital-first strategy to serve as the foundation for operational resiliency (see Figure 1).

Figure 1: **Digital-First Strategy in Response to Disruption**



Source: IDC Future Enterprise Resiliency & Spending Survey - September 2021

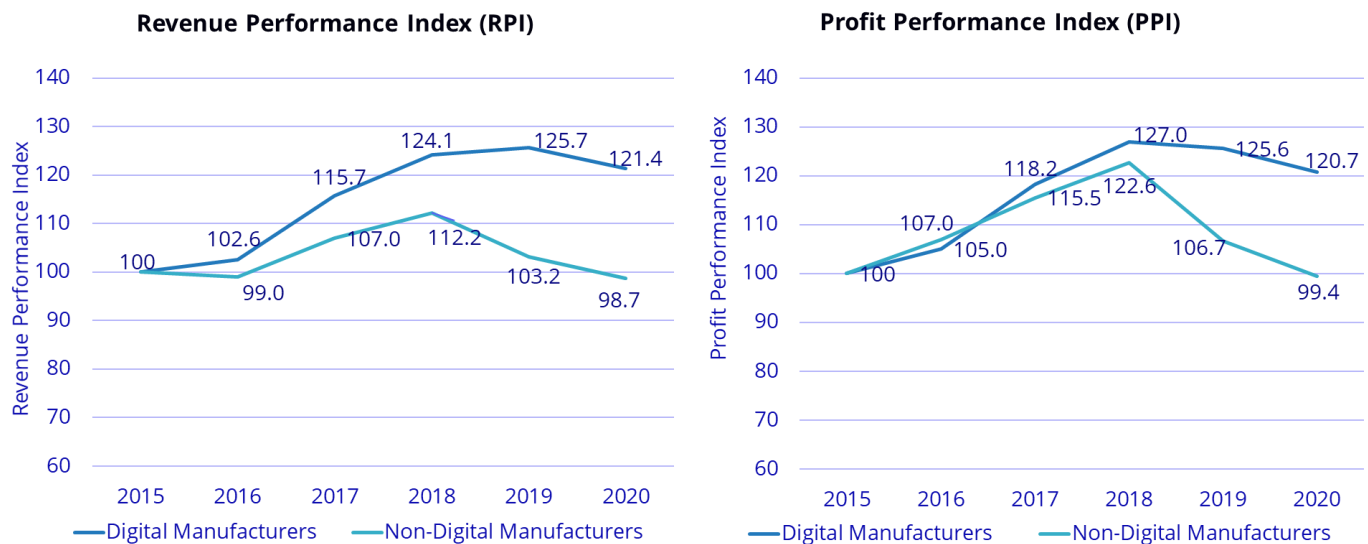
However, some manufacturers had already made investments in modernizing their operations and offerings, improving their ability to respond more effectively. As a result, a "digital divide" exists between early adopters and those just now modernizing, with digital manufacturers feeling less of an impact and further along in their recovery efforts. These manufacturers are now focused on innovating and trying to capture market share, while nondigital-enabled manufacturers are still focused on cost-cutting initiatives and selling off high-risk projects. Technology solutions have continued to mature, and there is no need for manufacturers to continue to rely on outdated systems.

Benefits

Digitization has long been the backbone of operational effectiveness for manufacturers. IDC's recent Digital Manufacturing Study of 680 publicly traded manufacturers highlights the clear advantage that accrues over time for organizations that embrace digitization. Over the study's six-year period, digital manufacturers benefited from a 26% increase in their revenue performance index (RPI) and a 27% increase in their profit performance index (PPI). During this same time, nondigital manufacturers experienced decreases of 9% in RPI and 2% in PPI.

While it is no surprise that the manufacturing industry as a whole saw a dip throughout 2020, digital manufacturers were less impacted by COVID-19 than their nondigital counterparts. This highlights the important fact that digital technology inhibits the impact of disruption (see Figure 2), which is why there is such a large shift in thinking among manufacturers in terms of a digital-first mindset.

Figure 2: **Digital Initiatives Impact the Top and Bottom Line**



Source: Source: IDC Digital Manufacturing Study, 2021

The biggest takeaway from the study is how the gap between the two groups increases over time. Many companies have already acted, using digital technology to make better decisions, and they are reaping the benefits. This gap has only increased because of COVID-19, as manufacturers with digital investments already in place were able to adapt much faster than those without. The question non-digital manufacturers need to ask themselves is, how much longer can we wait? The more time that passes without taking any action, the more of an advantage their peers experience. In today's highly competitive manufacturing environment, where disruption can occur at any moment, companies cannot risk inaction.

While many manufacturers realize the importance of becoming digital and more data driven, many still lack the expertise to build out a road map and execute on it. In fact, IDC's February 2022 Manufacturing Talent Management Study showed that over 40% of manufacturers are currently understaffed, with the majority expecting to be over the next few years. Manufacturers have been combating a growing talent gap across their organizations for years, with the same talent survey showing that IT and Operations/Production are the two groups most impacted.

DX is a journey and not a destination, so building out a road map is the first step for any company looking transform. Creating a road map for digital investment remains one of the toughest DX challenges for most businesses. Manufacturers in particular are struggling, with 66% stating they are looking for outside help planning their DX strategy

Leaders in manufacturing understand the importance of digital skills to maximize their DX efforts.

(Source: IDC DX Executive Sentiment Survey May 2021). Working with partners that can help with developing and executing the digital road map is an important step that the industry has started to embrace. The right partners can provide both technical and industry expertise to DX projects, this wealth of insight can be a difference maker when building out the DX road map and identifying to the most valuable use cases for a manufacturer to prioritize.

Considerations

Even with a strong digital plan in place, there are significant external and internal challenges to becoming a resilient organization. Data must be at the core of any digital transformation effort, organizations that do not focus on their data strategy will struggle with scaling their DX initiatives and be unable take advantage of the newest technologies such as AI/ML which have the potential to dramatically improve the decision-making process. While AI / ML is an area of interest across the industry, if AI / ML is applied to bad data then bad decisions are likely to be recommended. Properly managing and providing access to high quality data also serves as the foundation for Intelligent Process Automation (IPA). IPA is a strategic imperative for enterprises to accelerate their digital transformation by digitizing business operations and delivering radical improvements in process efficiency, productivity, employee performance, and operational intelligence. Manufacturers face many challenges when building and executing on a data strategy, which often results in pilots that fail to scale and a lack of return on investment for these initiatives. Common pitfalls holding manufacturers back include the following:

- » **Legacy/Siloed Systems.** One of the most cited roadblocks to becoming a data-driven enterprise is the use of legacy or siloed systems. This issue of silos has existed for years but is becoming worse in today's data-rich world. However, silos extend to more than data and affect also organizational structure, staff, and processes. They result in lost productivity, exposure to unnecessary risk, opportunity cost, and in sub-standard customer, employee, and external stakeholder experiences. Rip and replace is not a realistic approach for manufacturers, it is important to innovate around the edge and try to maximize the value of systems already in place wherever possible.
- » **Actionable and Timely Information.** Manufacturers tend to focus most efforts on information capture and delivery of reports that highlight past performance, rather than supporting all the steps in decision-making process. It is important to keep in mind that becoming a data-driven organization does not mean the delivery of more reports, dashboards, or other human consumable indicators of past performance or status of operations. Rather, it means the ability to deliver actionable information in the context of its recipient. This is where true value can be derived and what will differentiate successful manufacturers from those that struggle to compete.
- » **Lack a Talent/Expertise to Support Digital Initiatives.** As digital technology has become more widely available to manufacturers having a workforce with the skills to take advantage of these tools is also essential. Digital literacy/skillsets are often an area lacking from the already limited manufacturing workforce, the industry needs to look to partners to augment these growing skills gaps. The LOB is being tasked with innovating faster than ever before, IT executives within manufacturing consistently say they struggle to keep up with the increasing demands from the business. That is why it has become critical for manufacturers to turn to systems that allow for configuration/self-service for non-technical users.

Conclusion

The manufacturing environment is changing faster than ever before. As the industry comes to terms with this shift, organizations that embrace resiliency will become the most successful. The improvements that can be realized through data-driven decision making are too important to overlook. However, using data to make decisions requires that the proper digital foundation be in place, something many manufacturers currently lack. Given the complexities of managing the increasing amounts of data from products, operations, supply chains, and customers, manufacturers should consider working with a partner that can help them modernize their business and turn their digital pilots into full-scale digital transformation deployments.

About the Analyst



Reid Paquin, Research Director, IDC Manufacturing Insights

Reid Paquin is Research Director for IDC Manufacturing Insights responsible for the IT Priorities and 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 his background covering the manufacturing space, Mr. Paquin's research also includes an emphasis on the technology enablers that help manufacturing executives make better-informed operational decisions.

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