

MANUFACTURING RESILIENCE: A VIEW OF BEST-IN-CLASS PRESERVATION AND PERFORMANCE

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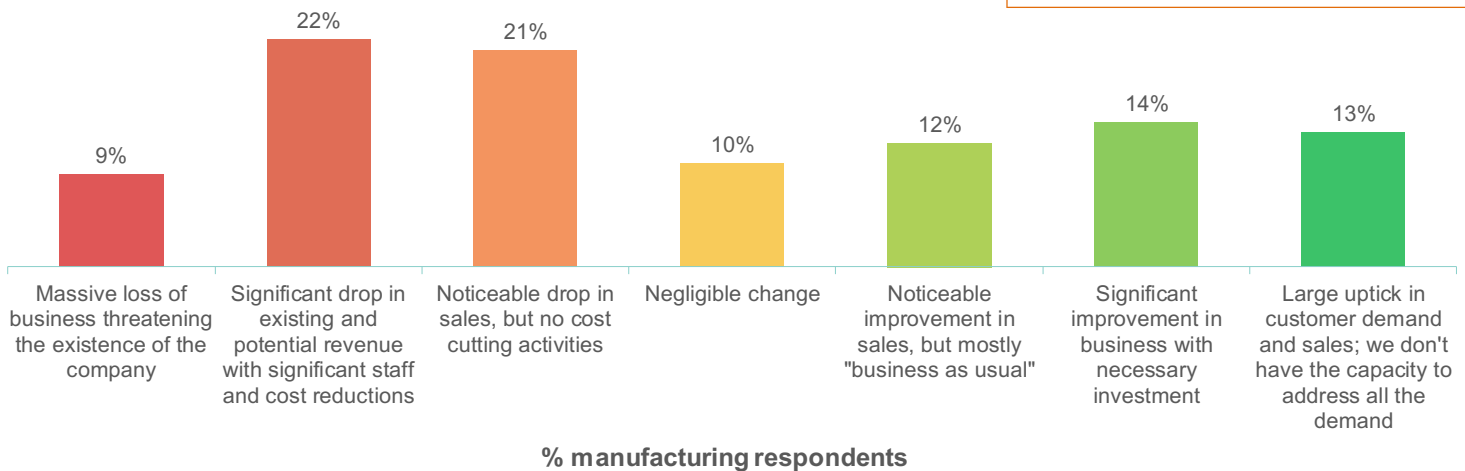
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Manufacturing organizations are still navigating the business landscape resulting from the COVID-19 pandemic. Best-in-Class manufacturers, through the implementation of a connected platform, are amplifying the impact of their technology enablers to support agility and resilience. They are empowering their employees to excel in a remote work environment and are positioning themselves well for future scaling initiatives.

The Current State of Manufacturing Amidst COVID-19

Manufacturing divisions are one of the top business units to see a massive disruption as a result of the COVID-19 pandemic. Transitions to manufacturing PPE, regulations to ensure the safety of factory workers, and requirements to reduce overall costs are weighing on the minds of manufacturing leaders. All in all, 51% of manufacturers have experienced a decrease in sales during the fluctuating downturns that have plagued the worldwide economy in 2020 (Figure 1).

Figure 1. Impact of the Economic Downturn on Manufacturers



n = 1,976, Source: Aberdeen, December 2020

The 31% of manufacturers who are experiencing a massive or significant loss of business are in survival mode. They are doing whatever they can

The Aberdeen maturity class framework is comprised of three groups of survey respondents. This data is used to determine overall company performance. Classified by their self-reported performance across several key metrics, each respondent falls into one of three categories:

- ▶ **Best-in-Class**
Top 20% of respondents based on performance
- ▶ **Industry Average**
Middle 50% of respondents based on performance
- ▶ **Laggard**
Bottom 30% of respondents based on performance

to keep their business running. The 43% of companies that range from seeing a noticeable decrease to a noticeable increase in sales are in recovery phases and are working toward operating at pre-pandemic levels of efficiency. The successful 27% of manufacturers who are experiencing a significant or large increase in sales are thriving despite the general economic downturn. While industry certainly plays a role in whether or not manufacturers are surviving, recovering, or thriving moving into 2021 (see sidebar), businesses that have strategies in place to promote flexibility and resilience are better equipped to move into the thrive phase and address future disruptions.

The shift to remote work has forced many manufacturing and engineering teams to invest in technologies that promote business agility and resilience. Aberdeen research shows that 77% of manufacturers are continuing or increasing their spend for new technology and 79% are continuing or increasing their spend for upgrading existing technology solutions. Implementing a connected platform is an efficient approach to integrate this myriad of technology solutions and provide employees with fluid access to the tools they need to do their jobs.

A **connected platform** unifies and simplifies the management and utilization of online services and technology solutions by bringing together all necessary applications in a single, centralized location. A connected platform approach reduces the need to manually transition between apps and improves data sharing, which ultimately increases collaboration, productivity, and innovation. Only 57% of manufacturers are satisfied with their remote work environment, indicating that there is a need to improve the ability to connect to platforms, systems, and machines remotely. Connected platforms do just that.

Top performing companies have enacted strategies to connect their technology solutions and further their recovery efforts, and they are succeeding even amidst the current economic downturn. Best-in-Class companies have been more likely to see an increase in new product introductions, complete and on-time shipments, and overall equipment effectiveness over the course of the pandemic (Table 1).

Economic Impact by Industry

Industrial

- ▶ Increase in sales: 27%
- ▶ Decrease in sales: 64%

Med Devices

- ▶ Increase in sales: 31%
- ▶ Decrease in sales: 60%

Automotive

- ▶ Increase in sales: 31%
- ▶ Decrease in sales: 49%

Consumer Goods

- ▶ Increase in sales: 47%
- ▶ Decrease in sales: 43%

Only
57%

of manufacturers are satisfied with their remote work environment.

Table 1. Best-in-Class Maturity Matrix for Manufacturing

Reporting Metric	Best-in-Class Top 20%	All Others Bottom 80%
Average percent change in NPIs (new product introductions) over the course of the pandemic	+ 6.1%	- 12.2%
Average percent change in complete and on-time shipments over the course of the pandemic	+ 84.8%	+ 6.9%
Average percent change in OEE (overall equipment effectiveness) over the course of the pandemic	+ 88.5%	+ 14.9%

This report will explore the tactics and plans Best-in-Class companies have in place to cope with the current business environment and how these strategies are enabling them to outperform their competitors. A connected platform provides a foundation for leveraging these Best-in-Class strategies and optimizing business results.

Technologies for Building Business Resilience

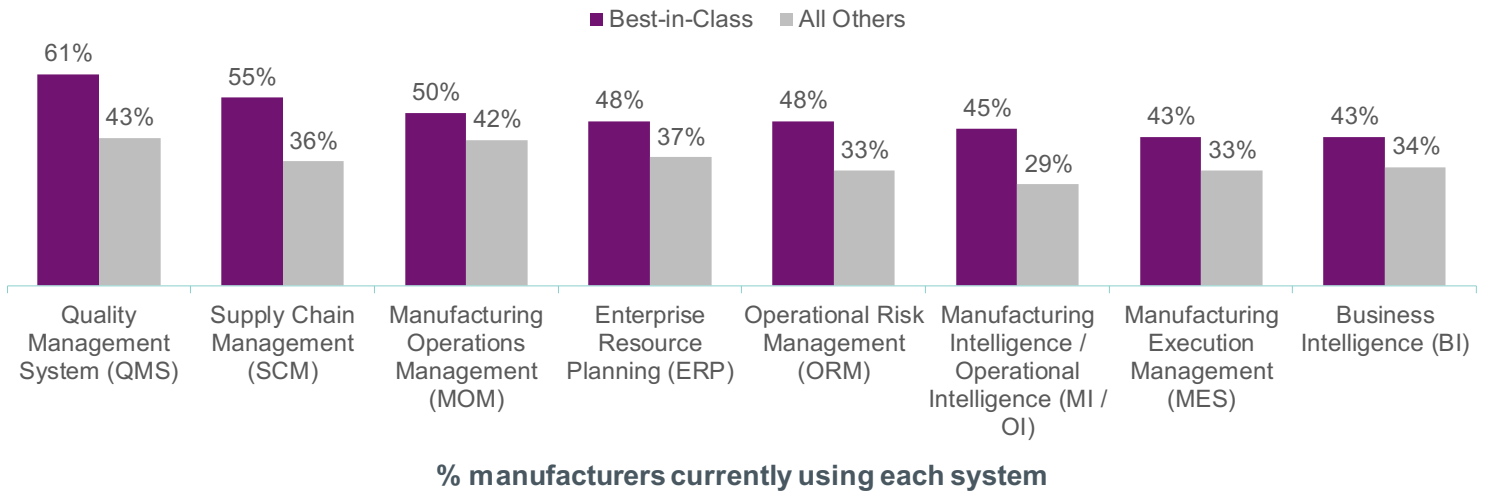
A large percentage of manufacturers are maintaining or increasing spend for new technology, but which technology solutions should they be focusing on? Best-in-Class manufacturers are 104% more likely than All Others to view investing in tools and technology that support flexibility and agility as a critical tactic for their organization in the future. These top performers are prioritizing product quality, process efficiency, and operational visibility when distributing their technology budget. QMS, SCM, and MOM are Best-in-Class solutions that are aiding top companies in delivering high-quality products on-time and on-budget (Figure 1).

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more likely to view **investing in tools and technology that support flexibility and agility** as a critical tactic for their organization in the future.

Figure 1. Technologies for Coping with the New Business Environment



n = 1,976, Source: Aberdeen, December 2020

With QMS, manufacturers are able to minimize the cost of non-quality and identify defects before they reach production stages of the product lifecycle. Comprehensive SCM systems connect the factory to retail, service, and other areas of the business. The percentage of complete and on-time shipments hinges on supply chain efficiency. SCM solutions help manufacturers identify external disruptions and at-risk shipments. MOM solutions provide visibility into end-to-end processes on the factory floor, and, in a remote environment, MOM systems are essential for managers to monitor production and keep everything running smoothly from home.

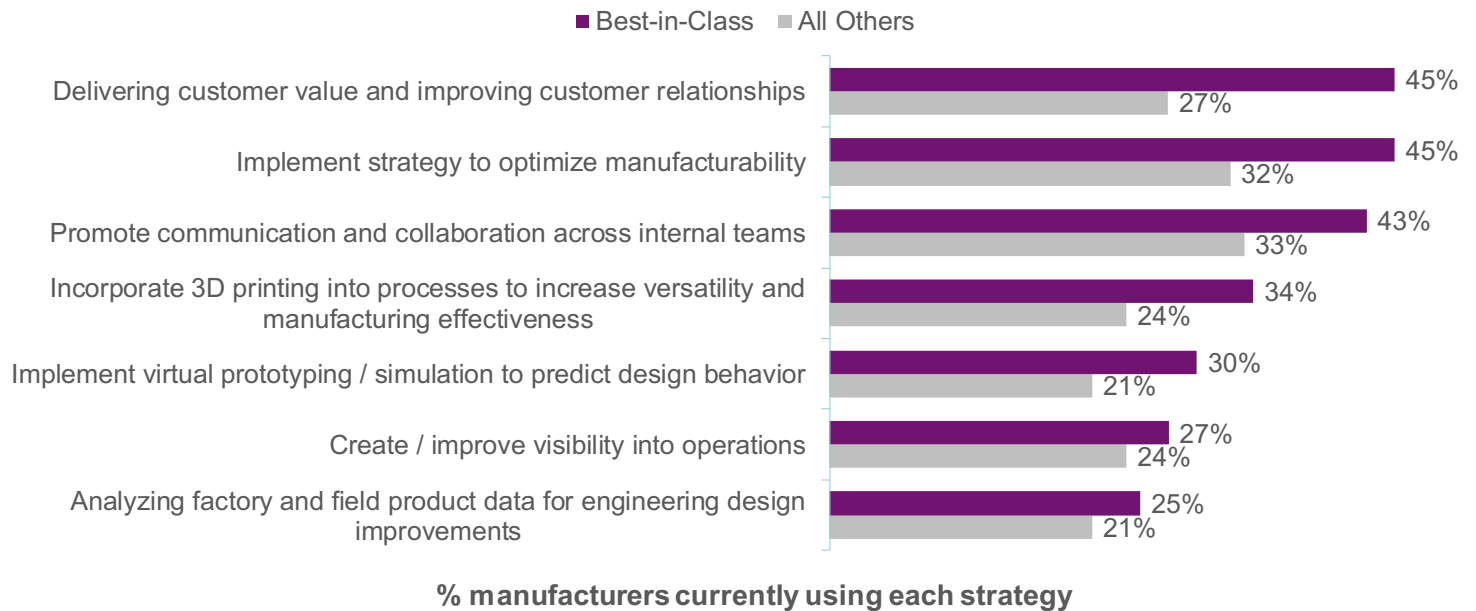
Manufacturing intelligence and business intelligence optimize companies' manufacturing operations and planning during these uncertain times. When integrated with ERP solutions, these systems provide a complete financial view of the business, helping leaders identify areas to cut costs, reduce waste, and increase efficiency. With so many systems in play, companies need a connected platform where engineers and manufacturers store, access, and utilize data. All of these systems enable manufacturers to fortify their business and prepare for future disruptions.

Strategies for Improving Business Agility and Addressing Economic Volatility

In addition to providing a centralized location for technology solutions, connected platforms are essential for enabling Best-in-Class strategies for resilience and maintaining communication throughout manufacturing and design processes. Best-in-Class companies are prioritizing their

customer relationships, manufacturability, and collaboration when managing the effects of COVID-19 (Figure 2).

Figure 2. Strategies for Managing the Effects of COVID-19



n = 1,976, Source: Aberdeen, December 2020

A heightened focus on delivering customer value improves customer trust, which is critical in times of economic uncertainty. With more positive customer relationships, manufacturers are able to effectively monitor the financial status of their customers, plan for changes in demand, and help their customers wherever possible. Optimizing manufacturability is also a top priority for Best-in-Class companies. Designing and specifying parts that are easy to manufacture and assemble increases productivity while decreasing costs, which are key elements for improving OEE, optimizing material utilization, and managing budgets amidst economic volatility. Connected platforms enable manufacturers to easily combine design and process data to determine which materials and parts will optimize functionality and manufacturability.

Using 3D printing and simulation in design processes also saves manufacturers time and money during prototyping phases. With the ability to virtually model and test designs, companies leveraging simulation are better suited to reduce the number of physical prototypes. With the ability to model and test design in a low-risk, low-cost physical environment, companies leveraging 3D printing identify quality and design issues before designs move into production. These two design tools promote flexibility and agility in manufacturing by giving engineers the capability to build, verify, and change designs quickly and inexpensively. When built

into a connected platform and integrated with other key manufacturing technologies, 3D printing and simulation increases efficiency even further by incorporating data from other areas of the product lifecycle.

A connected platform brings together data from all areas of the business to amplify these strategies and provide visibility into all operations. Greater visibility into operations and insight into factory and field data provides a holistic view of products throughout the product lifecycle and gives leaders the information they need to make strategic decisions.

Most Impactful Strategies for Struggling Companies to Regain Stability

While all the strategies listed above are beneficial for manufacturers to develop business agility and resilience, companies that are in survival and recovery phases often don't have the ability to implement them all. Aberdeen research shows that two of these strategies stand out above the rest when it comes to their business impact: 3D printing and greater visibility. Companies that are incorporating 3D printing into their manufacturing processes or improving visibility into operations are seeing greater improvements in business metrics related to revenue and productivity (Table 2).

Table 2. Business Impact of Key Best-in-Class Strategies

Metric	Incorporate 3D Printing	Improve Visibility into Operations
YOY percent improvement in revenue	+106%	+97%
YOY percent improvement (decrease) in time-to-decision	+346%	+296%
YOY percent improvement in project profitability	+69%	+283%
YOY percent improvement in productivity	+24%	+169%
Percent of complete and on-time shipments	+191%	+28%
Overall equipment effectiveness	+10%	+39%
Capacity utilization	+192%	+74%
Raw material utilization	+87%	+48%

Percent difference between companies that are utilizing each strategy and those that are not

n = 1,976, Source: Aberdeen, December 2020

Manufacturers that leverage 3D printing are seeing a much larger improvement in time-to-decision and far greater performance in complete and on-time shipments and capacity utilization. In prototyping phases, 3D printing brings design issues to the surface before designs make it into production. This allows engineers to quickly make decisions regarding designs, efficiently adjust designs, and, ultimately, send high-quality designs into manufacturing processes. Without the time-consuming back and forth between the factory and engineering teams and costly engineering change orders, companies minimize waste from defective products, reduce machine downtime, and keep their shipments on schedule.

Visibility into operations is critical for project profitability, time-to-decision, and productivity. Technology that tracks and records the status of every design, part, product, and shipment increases project efficiency by alerting managers when things are missing or behind-schedule, identifying potential bottlenecks, and providing insight into cost-effectiveness. When decision-makers have access to this data, they are better informed and can draw conclusions more quickly. Greater visibility also enables manufacturing process optimization to increase overall machine, engineer, and technician productivity.

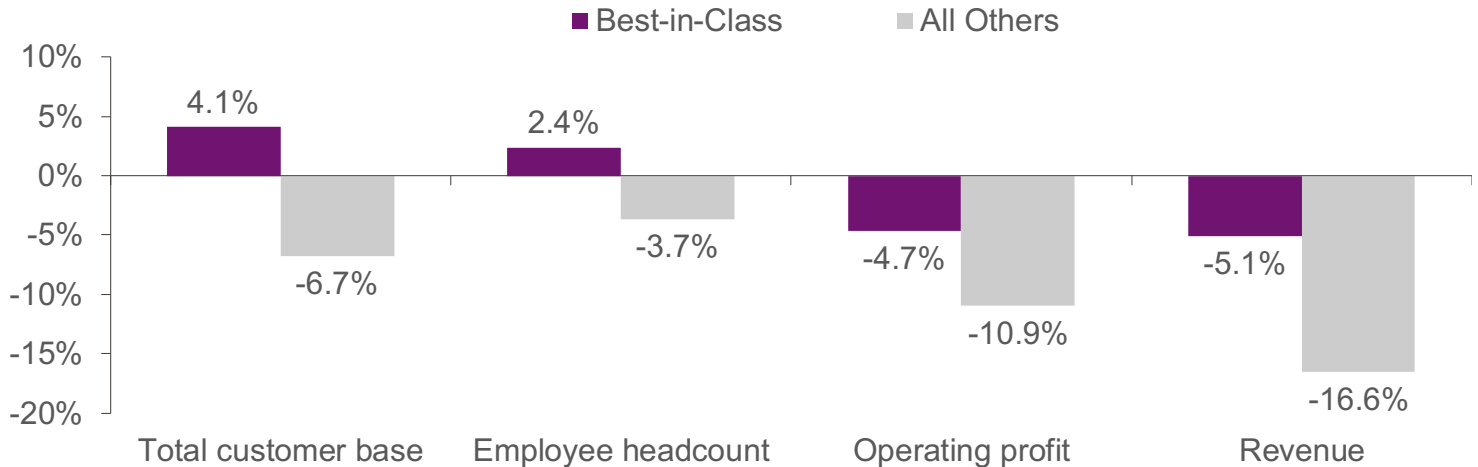
While incorporating 3D printing and improving visibility are good places to start, they are more effective when paired with other solutions and integrated into a connected platform. With a connected platform and visibility into data from various manufacturing applications, manufacturers are better able to identify problems in all stages of the product lifecycle and even into the field.

Benefits of Best Practices and a Connected Platform Infrastructure

Comprehensive technology solutions integrated on a connected platform provide a complete view of manufacturing and engineering operations. With this approach, Best-in-Class companies have been able to mitigate the effects of the COVID-19 pandemic and maintain their dominance in the industry. Most organizations are seeing decreases in KPIs as a result of the fluctuating economic shutdowns, but Best-in-Class companies are seeing smaller decreases and even increases in some cases (Figure 3).

While incorporating 3D printing and improving visibility are good places to start, they are more effective when paired with other solutions and integrated into a connected platform.

Figure 3. Best-in-Class Results: Maintaining and Mitigating




Weighted average of percent change over the course of the pandemic

n = 1,976, Source: Aberdeen, December 2020

Best-in-Class companies have managed to maintain their customer base and even grow it by 4.1% on average. All Others, on the other hand, have seen a 6.7% average decrease in their customer base over the course of the pandemic. This is no surprise as Best-in-Class companies are 67% more likely to prioritize delivering customer value and improving customer relationships (Figure 2). Best-in-Class companies have also been able to maintain their headcount and increase it by 2.4%, while All Others have seen a 3.7% decrease in headcount on average. By investing in key technologies that promote agility, such as 3D printing, and compounding those effects through integration and visibility, Best-in-Class companies have found ways to keep their employees afloat.

Even though Best-in-Class companies are experiencing decreases in operating profit and revenue, they are softening this blow and implementing initiatives to get their organizations back to pre-pandemic levels of performance. The strategies they have put in place, which become more effective with a connected platform approach, make them better prepared to quickly adjust to future disruptions.

Key Takeaways and Recommendations



Connected platforms are the foundation for leveraging Best-in-Class strategies. They promote communication, visibility, and control in today's remote work environment, and they enable manufacturers to gain insight into, react to, and plan for internal and external disruptions. When reflecting on the most influential Best-in-Class strategies for building business resilience in manufacturing, there are a few key points to highlight:

- ▶ **Technology enablers are critical for recovery and future resilience.** MOM, QMS, and SCM in particular are essential for delivering high-quality products on-time and within budget. Maintaining customer relationships during times of economic uncertainty through quality and reliability aids manufacturers in building customer trust that will withstand future economic disruptions.
- ▶ **Initiatives for reducing operating costs aids in resiliency efforts.** Many companies are looking for areas to save money as they work through recovery phases. Optimizing designs prior to production reduces the number of engineering change orders and prevents costly quality issues further down the line.
- ▶ **A connected platform is essential for enabling Best-in-Class strategies.** The impact of 3D printing, simulation, and visibility into operations is amplified when different systems are working together on a unified platform. With the information to make decisions all in one place, manufacturing leaders are better equipped to make strategic plans for scaling operations.

Whether they are increasing their customer base and growing to meet demand or focusing on cutting costs to survive, all manufacturers can benefit from following in the footsteps of the Best-in-Class. As leaders determine the best course of action for their business moving into 2021, these Best-in-Class strategies make a difference in productivity, profitability, and overall success.



Related Research

- ▶ Building Resilience and Agility in Manufacturing: How Innovation Breeds Success; September 2020
- ▶ Building Business Resilience: Merging Finance and Operations Planning; June 2020
- ▶ The Virtues of Virtual Prototyping: Accelerated Product Excellence; January 2020

About Aberdeen

Since 1988, Aberdeen has published research that helps businesses worldwide to improve their performance. Our analysts derive fact-based, vendor-neutral insights from a proprietary analytical framework, which identifies Best-in-Class organizations from primary research conducted with industry practitioners. The resulting research content is used by hundreds of thousands of business professionals to drive smarter decision-making and improve business strategies. Aberdeen is headquartered in Waltham, Massachusetts, USA.

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