The Future of Manufacturing:

Digital Acceleration

New trends and innovations for the industry
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Can digitization save the manufacturing industry?

The COVID-19 pandemic has created unprecedented challenges across the board for manufacturers, both for those forced to pause or scale down operations as well as those struggling to keep up with a deluge of demand for essential supplies.

According to a National Association of Manufacturers survey, 78.3% of manufacturers anticipate a financial impact from the pandemic, while 53.1% of manufacturers anticipate a change in operations and 35.5% of manufacturers are facing supply chain disruptions.

Companies have grappled with immediate challenges, such as keeping workers healthy, maintaining productivity, and inventory issues, while also considering long-term effects, including economic weakness, worker retention and upskilling, and predicting future obstacles.

Even before the pandemic, manufacturers faced increasing uncertainty in areas including tariffs, shifting supply chains, and labor supply, and this will continue going forward.

"Change" is the watchword for the industry now, reflected in major ongoing trends such as an emphasis on supply chain resilience and the march toward digitization.

It is this trend toward technological adoption that may prove to be a silver lining, as manufacturers turn to digitization to provide the agility, efficiency, and innovation they need to not only survive but to thrive. Many companies have accelerated their digital journey during this period of crisis in order to simply keep the lights on. Many more will find that technology is crucial to navigating a successful future.

It is through this lens that we present our report on the trends, challenges, and opportunities facing the manufacturing sector. We surveyed 50 manufacturing executives on the state of the industry, and their insights offer a look into the present and future of manufacturing.
Manufacturing’s response to the COVID-19 pandemic

In order to understand the future of manufacturing, it’s important to understand the industry’s current situation — which is dominated by the COVID-19 pandemic and its fallout.

While the pandemic and subsequent shutdowns created shock-waves across the system, many of the manufacturing executives surveyed felt that they were at least somewhat prepared when the pandemic arrived.

Of those surveyed, 44% felt they were very or mostly prepared to handle the challenges of the pandemic, with 32% were moderately prepared and 24% were slightly or not at all prepared.
This preparedness has allowed most manufacturers to continue to operate. For example, according to information gathered by PMMI, The Association for Packaging and Processing Technologies, as of April, most companies were working [83%] with capacity levels of up to 95%, while 13% had closed their offices and only 3% had shut down their plants.

While the pandemic created multiple challenges for manufacturers, the health and safety of their workers was top of the list, chosen by 30% of respondents as the most important challenge in the wake of COVID-19.

That was followed by lack of supply chain visibility and predictability [24%], stringent compliance requirements, and being able to pivot quickly based on global economic uncertainty [16% each], and inventory issues [14%].

**How leaders are adapting:**

- Advanced data collection and analytics can provide an accurate view of what’s happening on the floor in real time without requiring managers to be physically present.

- Tools such as cameras, IoT monitoring devices, smart glasses, and collaboration software can facilitate remote inspections and troubleshooting as well as meetings and other communication.

- Cloud computing, in which systems and data are run and stored offsite and accessed online, allows companies more possibilities for remote work and collaboration.

  - A report from the Manufacturing Leadership Council highlighted the example of printer manufacturer Lexmark, which was able to execute its global business continuity plan in just two days because it has all systems in the cloud. It went from only a few employees working at home to 94% [with some plants still open], without impacting system performance.
**Confidence in supply chain resilience in the wake of COVID-19**

Following the pandemic, manufacturers are largely confident in the resilience of their supply chains — and they are actively working to make those chains stronger.

Of those surveyed, 40% are very confident or mostly confident in their supply chain resilience in the wake of COVID. Of those surveyed, 34% are moderately confident, while 24% are slightly confident and 2% are not at all confident.

Nearly half [48%] of respondents have found secondary/tertiary suppliers in order to help prepare/future-proof their business.

Going forward, supply chain resilience will continue to be a priority in the industry, with manufacturers emphasizing diversity in the supply chain and investment in technology to enable a nimble response to supply chain variables.

**How leaders are adapting:**

- Digital supply chain management platforms create a single source of truth for more transparency and enhanced coordination and risk management.
- These can provide real-time data on essential information such as prices, inventory, lead times, transportation, and more.
- Advanced analytics can provide predictive insights to spur proactive planning rather than only relying on past data.
- Visualization technology can help leaders detect patterns to make sense of analytics results.
Staying ahead of whatever is next

“As our customers managed the complexity of their everyday businesses, many turned to their data to be more nimble on the production line. This was a great start, yet we see new looming threats based on fluctuations in consumer spending that cannot be ignored. This is where predictive analytics, coupled with AI and machine learning, can really make the difference in efficiency and resiliency.”

- Brad Smith, Director of IoT and Analytics, MCA Connect

While manufacturers are understandably currently focused on managing the fallout of the COVID-19 pandemic — and its implications going forward — they are also cautiously optimistic.

More than half [52%] said that they were either very optimistic or somewhat optimistic about the outlook for the industry over the next 12 months, with nearly a quarter [24%] very troubled or somewhat troubled about the outlook, and another quarter [24%] unsure.

Some of their key concerns for both the short and long term include optimizing data, cybersecurity, reducing downtime, better connecting information and operational technology, and maintaining a qualified workforce.
Collecting and connecting data

Data is the heart of digitization. Digital technology enables companies to collect and connect their data in order to provide actionable insights that produce real results.

Investing in technologies that make better use of data also provides real value: According to McKinsey, analytics and artificial intelligence (AI) capabilities are expected to offer between $9.5 trillion and $15.4 trillion in annual economic value.

Our survey showed that making the most out of data is a key goal for many manufacturing executives. Half of all respondents chose the categories of unlocking and uniting data or real-time insights as their most important short-term goals. The pandemic has only increased the need for modernizing out-of-date or legacy systems, with many companies stepping up their Enterprise Resource Planning (ERP) schedules.
How leaders are adapting:

- ERP platforms are crucial linchpins in harnessing the power of data helping companies manage the entire production life cycle, customer life cycle, and supply chain. ERP systems tailored specifically for manufacturers provide processes, templates, tools, and services most commonly required by the industry and should offer:
  - API integration, which links various systems together
  - Seamless integration with business and productivity applications that the company already uses, such as Microsoft Office
  - Easy customization to accommodate business growth and changes
- Data warehousing solutions such as MCA’s DataCONNECT — a solution built on the Microsoft platform — consolidate data across the organization to offer a single source of truth. Data warehouses enable forecasting, predicting, adapting, and shaping operations for future planning cycles.
- Data analytics and visualization technology help enterprises make sense of that data and unlock insights that are accurate and actionable.

Reducing downtime/proactively predicting maintenance

Reducing downtime is crucial for leaders in our survey. More respondents [44%] chose this as their most important single short-term priority than any other category. On a related note, the second most-popular category was proactively predicting maintenance, which nearly a third [32%] of survey respondents chose as their most important short-term priority.

These issues are important for respondents in the long term as well, with a total of 50% naming these two categories as their most important long-term goals.

Most important single short-term priority

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<th>Priority</th>
<th>Percentage</th>
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<tr>
<td>Reducing downtime</td>
<td>44%</td>
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<td>Proactively predicting maintenance</td>
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How leaders are adapting:

- Real-time monitoring technology offers managers an accurate picture of the production process and enables quick assessment and prioritization of responses to problems.
- Machine learning and predictive analytics can be used to alert teams when a component issue may be imminent, allowing operators to act in advance and prevent unplanned downtime.

Better connecting information and operational technology

While optimizing data is crucial toward improving production, data cannot be optimized if it can’t be collected. In manufacturing, that data comes from operations, and to truly unlock it, operational technology needs to work together seamlessly with the information technology that can process and interpret it.

In our survey, 26% of respondents chose better connecting information and operational technology as their most important short-term goal.

Reaching these goals means not only deploying more Internet of Things [IoT] devices to capture data, but harnessing that information with the right tools to glean actionable insights using data visualization and artificial intelligence.

However, there is still work to be done on this front. A Manufacturing Leadership Council survey showed that only 9% of companies felt prepared to use all their IoT device data to drive decisions.
Combining IoT data and business intelligence solutions can produce insights for better forecasting, resulting in more efficient processes and consistency.

More manufacturers will start using digital twins, which digitally simulate operations, for projects such as optimizing supply chain efficiency, analyzing different scenarios for planning purposes, and incorporating product use feedback into design. The digital twin market is expected to grow 35% through 2024.

IoT and machine learning can alert manufacturers to problems before they arise. Tools such as MCA Connect’s Voice of the Operator software — built on Microsoft Dynamics 365 — go a step further, closing the feedback loop by asking operators to confirm and troubleshoot identified problems. This marries the power of human observation with technology.

**Maintaining a qualified workforce**

Even before this year’s pandemic, tight labor markets have been an ongoing concern for manufacturers. As many as 2.4 million manufacturing jobs are estimated to go unfilled between 2018 and 2028, according to a skills gap study released by The Manufacturing Institute and Deloitte.

Half [50%] of our survey respondents chose maintaining a qualified workforce as their most important goal in the short term, with 44% choosing it as their most important long-term goal.

**How leaders are adapting:**

- Technology such as robotics and process automation can improve efficiency and reduce manual labor. Post-COVID-19, the global traditional industrial robotics market is projected to reach $73 billion by 2025.

- New methods of training, including augmented reality [AR] and remote delivery, can help companies teach employees the new skills that will be needed as the digital journey continues. The move to off-site consultations has also accelerated the use of technology as a way of connecting, not hamstrung by geography or time zones.

  - Usage of industrial AR for remote working has skyrocketed since the start of the pandemic, according to a report from Enterprise IoT Insights. IDC has projected that the market for industrial AR will grow by nearly 24% in 2020 compared with 2019.
Manufacturers are already adopting the technologies that can help them survive the present and move into the future. And they plan on implementing even more going forward.

Moving towards the future

Over the next five years, however, new technologies will be on the rise. For example, while only 16% of respondents are currently using artificial intelligence & machine learning, yet over half (52%) plan to be using these in five years. And while only 20% are currently using predictive analytics, 38% expect to be using this technology in five years.

Our survey showed that automation & robotics are already integral to manufacturing, with 58% of respondents currently using them and 60% planning to use them in five years. The next most-used technologies in our survey were data housing & management (56% currently using) and IoT sensors (44% currently using).
Opportunity for an innovative future

There is no doubt that 2020 has shaken up the manufacturing sector in a big way. But that shake-up also represents an opportunity to lean into a new direction, with a focus on innovation. Taking full advantage of tools such as cloud computing, advanced data collection and storage, artificial intelligence, robotics, IoT, and more will empower manufacturers to make faster decisions with more accurate information. Manufacturing leaders will rely more on real-time visibility into their global operations and true integration of the people, processes, and technology that make up their operations to create resiliency and improve every part of their business.

Technology will be the key to unlocking a future where manufacturers can better see what is around the bend and are nimble enough to take on whatever surprises may be in store.
Tailored manufacturing process

At MCA Connect, we specialize in helping mid-to-large manufacturing enterprises find the technological edge they need to adapt now and moving forward. The world's best manufacturing companies trust us to transform their operations digitally. We deliver comprehensive industry accelerators utilizing industry best practices where it fits and fine-tuning other areas to highlight the unique parts of your business.

Microsoft Dynamics 365 Manufacturing

We work closely with the experts at Microsoft to provide answers tailored to the specific needs of manufacturing. Our manufacturing solutions, built on the Microsoft platform, help you connect your equipment, analyze and visualize your data, and integrate your people and processes for fast, intelligent business decisions.

MCA Connect has continuously achieved Microsoft Gold partner status for nearly 20 years, and we've received numerous accolades for our industry achievements and excellence.

If you’re ready to kick-start your innovation journey, get in touch with us to learn more.

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