

of supply disruptions and decreasing the flexibility to adapt to fluctuations in demand.

Immediate Tactics to Reduce Your Risk

While the onset of the recent economic shutdown likely caught many manufacturers off guard, it's time to prepare for what is next.

Prepare for Demand Volatility with Flexible Start-Up and Shut-Down Plans

In the short-term, there will be pent-up demand, which could lead to a sharp ramp up as the crisis fades. However, there is also uncertainty going forward with the possibility of further waves of infection or other disruptions, so companies should expect demand volatility in the coming months. So, it is critical that automotive manufacturers prepare their start-up curve now, which will allow them to rapidly reengage their supply chain and manufacturing facilities to produce quality parts. It is just as critical to plan a shut-down curve to prepare to efficiently ramp *down* production throughout the supply chain if and when this happens again. Flexibility to adjust in an economically viable way will be key to meeting unpredictable demand in the coming months.

Automotive manufacturers that are further along in their digital transformation journey are leading the way with flexibility right now, because they have the ability to leverage digital technologies to run scenarios and consider options to determine the best path forward. An example of this is using virtual tools to reconfigure production lines, which allows process engineers to rapidly evaluate many new layouts or approaches to find the ones that realize the throughputs required while also providing social distancing for line employees. Similar tools can also be used to simulate shift changes or the logistics of lunch for large teams of workers to allow plant managers to develop risk-minimizing procedures prior to workers returning to the factory.

Preserve Technical Memory

Another consideration when ramping down and ramping back up is the concept of technical memory, which is where the company's technical capabilities reside and how others can access and learn from those insights. If technical memory resides only the minds of people, there is a risk that it could be lost over time through attrition or if some people do not return post-disruption.

To address this risk in the short-term, take this time to develop effective methods to capture and manage knowledge. Even before this current disruption, automotive manufacturers were investing in digital knowledge capture tools to help address knowledge loss through the aging manufacturing workforce. Moving forward, this could include documenting work instructions through wearable tablets coupled with augmented reality software tools. The crisis of today has underscored the importance of these initiatives.

Enable Remote Work and Collaboration

Social distancing, [remote work](#), and virtual collaboration are concepts that will become the norm, and a skepticism of crowds and gatherings will likely remain with us even after the pandemic has subsided. Automotive manufacturers that have already invested in a digital footprint to enable remote work and collaboration are currently faring better than others.

Enabling remote work requires an effective set of tools to digitally create, manage, and share CAD and other design data, as well as clearly defined business processes and a culture that is supportive of Model Based Enterprise—concepts to effectively control the 3D model as the source of truth rather than a drawing or other

object.

Video conferencing tools can enable business planning and product development efforts to continue in the short-term, and probably into the future as well. Build a digital footprint *now* to provide the flexibility to adjust to the platforms and unique ways of working of each OEM. This adaptability will be more valued by the OEMs in a post-crisis world and is a great opportunity for differentiation.

How to Reimagine Business as Usual

Even before current disruptions, the automotive industry was in flux. As we move into a new normal, this industry in particular will face ongoing demand uncertainty, so it can be difficult to imagine what the new normal will be, and even more difficult to prepare. What is clear is that in order to adapt to increased volatility in demand, either great forecasting or flexible operations is needed.

Improving Sales & Operations Planning (S&OP) processes can help avoid losses in a more uncertain world, but it is critical to consider increasing manufacturing flexibility as well. Global supply chains can lengthen lead time on components, expose manufacturers to currency fluctuation, and reduce flexibility, making it more difficult to react to demand shifts. The new normal will require rebalancing supply chains, which may include a shift back to regional supply bases, which would restore some of the flexibility that has been lost in recent decades.

While there are processes in an automotive plant that simply cannot be done remotely, many of them can be with digital manufacturing technologies. The new normal will likely leverage a Model Based Enterprise approach in R&D, which extends 3D models to the shop floor through a digital twin and remotely enables many processes that are done on site today. For example, remote production monitoring allows technicians and managers to track production from anywhere, and address issues when they arise. Specialized maintenance activities (which in the past have required specialists to travel into the plant) can be completed remotely leveraging augmented reality and the digital twin.

For tasks that cannot be done remotely, the new normal will require that manufacturing processes be consistent with the demands of social distancing, additional PPE, and smaller crews. With digitally enabled automation, plants can be operated by a smaller number of skilled professionals with more distance between them.

How to Prepare NOW for a Post-Crisis World

The automotive industry is dramatically different than it was at the beginning of 2020, so it is critical to take this time to reevaluate your supply chain and its fitness to succeed post-pandemic. Our current situation offers a silver lining—the opportunity to invest in the digital footprint required for the future. With production, business travel, and other major projects largely on hold, it is now easier to access leaders from across the company who are traditionally hard to get ahold of due to busy travel.

It's a good time to reevaluate digital strategies in this new world and plan for the immediate future. Start by crafting a digital vision to guide long-term efforts, and then look at current tools, such as video conferencing, CAD, [product lifecycle management \(PLM\)](#), product data sharing, MES, and [IoT platforms](#), to make sure that they are sufficient to enable the vision.

It's extremely important that the digital vision align with and support business goals. As the world recovers and restarts, these goals will include:

- **Reassessing global supply chains** to ensure that they are still appropriate in a global community prone to

disruptions. Investing in automation and shifting to regional manufacturing will improve flexibility to meet uncertain demand in the future.

- **Investing in process and technology to enable remote work** by strengthening the digital foundation to support a new way to discover, create, make, and sell products that is consistent with social distancing.
- **Enabling digital design and manufacturing capabilities** by leveraging a digital twin across the development cycle, layering in insights from advanced analytics and experiences from mixed reality to streamline the way work is done.

Companies that have already invested in a robust digital footprint to meet these goals have a distinct advantage right now. Those that can change direction quickly and decisively during the crisis and through the recovery will emerge with a competitive advantage as a result.

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