



# A Guide to Transforming Your Manufacturing Processes


Addressing Challenges and Opportunities in the “New Reality” of the Vehicle Industry



## Table of Contents

1. Introduction
2. Emerging Challenges in the Automotive, Truck and Heavy Equipment Industries
3. How Can Global Companies Adapt to Constant Disruptions?
4. How Decentralized Digital Systems Power Smarter Planning Processes
5. How Blue Yonder Supports Flexible Supply Chain Transformation





For vehicle manufacturers, uncertainty is the new reality

## 1. Introduction

In a supply chain landscape shaped by ongoing disruptions and continuous volatility, the truck and automobile industries must adapt to the fact that uncertainty is the new reality. Suppliers that manufacturers have relied on for years might not be delivering consistently, materials and operations costs are rising, customer expectations are growing, and demand might fluctuate wildly from day to day.

Though the level of uncertainty impacting global supply chains is unprecedented, the challenges facing manufacturers have all been lurking beneath the surface for years. Inflation, cost pressures have been steadily increasing, along with general unpredictability and risk. The difference now is that unpredictability across the value network has become impossible to ignore. Global businesses of all kinds, including car and truck manufacturers, need to stop waiting for uncertainty to end — and instead transform their operations for resilience and flexibility. This guide provides an overview of how truck and car manufacturers can address both challenges and opportunities with re-imagined processes, systems and structures. This guide covers the general state of advanced supply chain technologies, and how they can improve key metrics like lead times, delivery reliability and capacity utilization — both today and in the increasingly digitalized future.

Of course, every company is unique and will apply advanced technologies in different ways. But the universal truth is this: Big steps need to be taken to increase transparency, flexibility and connectivity in the face of new risks and challenges. Identifying the right general techniques and technology solutions is an important first step on the road to transforming your manufacturing operations to reduce costs, improve service, maximize resilience and achieve other benefits.

## 2. Emerging Challenges in the Automotive, Truck and Heavy Equipment Industries

To maximize their supply chain performance, manufacturers need to optimize lead times and delivery reliability, while maintaining a high degree of flexibility in case change in market conditions requires adjustment in their original plans. Their ability to pivot, both profitably and quickly, depends in large part on the business processes that support key activities like production planning, inventory management and logistics planning.

Today most car and truck manufacturers rely on static, repeatable processes to drive these functions. As a result, they encounter the same types of disruptions repeatedly — and, even when they do make adjustments, they're reactive instead of proactive and at times too late to make any genuine impact.

Clearly, something must change. Vehicle manufacturers need to revitalize their processes to create more flexible, agile workflows — workflows that adapt quickly to new information and give planners the ability to plan and replan on the fly, in a strategic manner. Without this ability, manufacturers are stuck repeating the same disruption resolution processes ad infinitum, even when they lead to negative cost and service impacts.

As disruptions continue to put pressure on vehicle manufacturers, flexible capacity planning is becoming more important than ever. A failure to adapt quickly enough to ongoing disruptions can erode service levels and drive enormous cost overruns — which makes flexibility in the moment a make-or-break proposition. Car and truck makers need new, optimized planning processes that are built for resilience, speed and responsiveness.

**New planning optimizations can drive cost savings of 10-20%**



## Integrating Business Processes and Systems

Of course, no business process exists in a vacuum. To contribute at the highest level, processes need to be enacted and enabled by advanced technology systems. If a manufacturer develops the institutionalized knowledge and the process know-how to create more flexible production planning and inventory management processes, these processes will still fail to add maximum value if they're not properly and fully integrated into existing systems. Traditionally, this kind of process-system integration begins with comprehensive process mapping, led by planners and IT professionals who work to build the right workflows and functionality into their technology infrastructure.

Unfortunately, many vehicle supply chains still rely on legacy systems for their basic business processes, and those legacy systems may not be capable of accommodating the big changes that come with smarter, more modern workflows. Even for systems that can be updated, car and truck makers will probably not be able to map all their new processes and workflows onto the existing technology systems.

The result is that, while manufacturers are more adaptable to changing circumstances in theory, they're still hemmed in by the limitations of their legacy software. If, for instance, their new system for securing freight capacity at the optimal price requires the use of key functionality. Even those car and truck manufacturers who are in the process of modernizing their legacy systems often have complex data migrations to contend with. They find that making large-scale adjustments across the board can quickly become costly.

Some manufacturers respond by adopting the kinds of monolithic ERPs we just alluded to, but these present their own risks. Since they're not built to be modular or lightweight, they often make true flexibility difficult. And, since different departments can't adapt the ERP system to their actual needs, they wind up seeking out "shadow IT" that doesn't integrate with the rest of the system. As a result, new business processes may be operational at one touchpoint of the value chain, but

otherwise completely siloed off from the rest of the business. Any added value manufacturers gain from flexibility in one area is lost at the next touchpoint, meaning that they're back to square one from a process transformation perspective.

## Optimizing Network Structures

We've all seen the kinds of things that can go wrong in the world of supply chain management and logistics — from a global pandemic or a natural disaster to a supplier bankruptcy or a new tariff. Across the value chain, hundreds of events have the potential to disrupt the most carefully considered plans.

Newer, more flexible processes and systems have become increasingly necessary to succeed in today's fast-changing environment. But even new systems and processes are likely not enough to position car and truck manufacturers for success. They most likely need to rethink their entire supply chain networks from the ground up.

Instead of relying on old supply chain structures, manufacturers need to reimagine how their processes and systems integrate with what's happening in the physical world of their plants and their larger network. Both inbound and outbound flows of parts and finished goods need to be integrated with digital data streams that help manufacturers track the real-time movement of goods. Their transportation network needs to real-time information, there are some legacy systems that will simply never support the real-time connectivity and data transfer that's needed, at the speed that's required. Without the ability to operationalize their new processes, manufacturers' improvement initiatives are destined to fall flat.

This problem is often compounded by the complex realities of many modern supply chain IT ecosystems. Manufacturers with monolithic enterprise resource planning (ERP) solutions notwithstanding, most companies rely on a mishmash of different solutions and applications — some modern and state-of-the-art, some dated and missing enable real adaptability, even for shipments that are under way but need to be rerouted.



Decentralized and heterogeneous systems can help reduce IT costs by up to 15%

While existing network structures might suffice for static routes and tours, they're not built for the modern, connected value chain. Only when the whole network has been effectively digitalized can car and truck makers begin to use advanced analytics and other technologies to optimize every node of the network for modern planning flows.

To reach this level of digitalization, it can help to implement modern innovations like Internet of Things (IoT) devices and other smart trackers — but, whatever approach manufacturers take, it's critical that their entire network exists in a digital space that accurately reflects physical realities. Car and truck manufacturers need to move beyond manual analysis, intuition and human cognition to build mathematically optimized systems that intelligently and proactively.

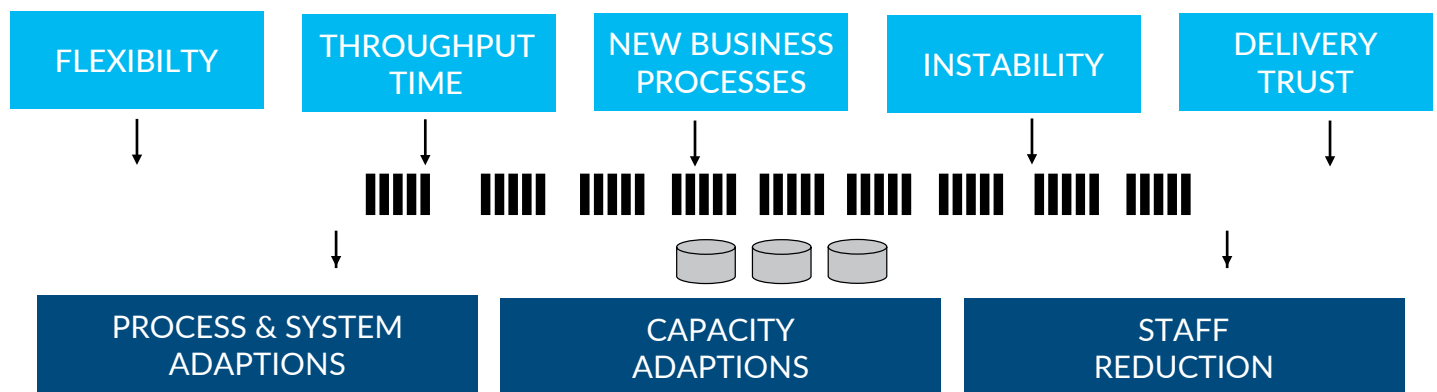
All this work will just be a preamble to the main event: Industry 4.0 and Logistics 4.0 systems that run on modern, smarter technology. Automotive industry leaders are already implementing innovations like self-regulating smart factories, electric mobility for the transportation fleet, smaller e-trucks for the last

mile, and eco-friendly technology that tracks carbon emissions. These advanced capabilities integrate tightly with distributed logistics planning structures that are more responsive than ever before.

As more logistics and production networks change to incorporate these elements, the nature of supply chain partnerships must also adapt to keep up. Leasing, rather than owning, vehicles will become more common, enabling capacity utilization to become more fluid. Production planners will try to limit the number of individual parts that go into manufacturing runs, to decrease the risk of disruption. All parts will be sourced more flexibly via shorter-term partnerships.

These capabilities may seem futuristic, but they've been in development for a while. Their adoption is only being expedited by the increasing frequency and scale of supply chain disruptions we're seeing today. The entire global economy has the potential to be reorganized, as new markets grow — and as existing markets change and potentially contract. Network structures will have to both change in the short term and remain flexible in the long term.

## COST FACTORS IN THE MANUFACTURING INDUSTRY



Different influences cause partly radical adjustment requirements: for processes, systems, capacities



### 3. How Can Global Companies Adapt to Constant Disruptions?

As already discussed, the first step for the truck and automotive sector is establishing new business processes that better address current market realities. But what does this look like in practice?

For one thing, it means radically streamlining standardized supply chain workflows to make them more transparent and dynamic. When planning a production program, vehicle manufacturers may schedule and sequence by using explainable artificial intelligence (AI) to visualize the effects of different plans, based on various horizons and parameters. They can rely on advanced technology to navigate the extreme complexity that led to static planning flows in the first place. The digital nature of the planning process means it will not only be more accurate, but also more transparent and less manually intensive.

When building out new processes, it's crucial to remember that efficiency and cost savings are the ultimate goals. Manufacturers must prioritize adjusting plans on the fly, which means they can realize savings when they identify potential opportunities. Processes also need to be performed in real time as new situations emerge.

Truck and automotive manufacturers may choose to begin with smarter, more forward-looking sales and capacity planning. Rather than just churning out the same volumes every year, or tweaking them up or down based on the most recent demand numbers, planners can use digital processes to improve their forecasts to create smart, responsive demand-capacity plans. This will ultimately require the integration of data from a variety of sources up and down the supply stream. By leveraging analytics algorithms designed to power improved projections planners can visualize each plant's capacity relative to likely demand, and then identify the optimal path forward.

Formatching that capacity to the actual orders received. This paves the way for cost optimization and potential savings of 10–20%.

Redefining key processes enables vehicle manufacturers to develop better-informed expectations and operationalize them in a smarter, more transparent way. Instead of scrambling to add production capacity at the last minute because they didn't understand the relationship between demand and parts/equipment utilization, manufacturers can see incoming orders emerging — and immediately secure the capacity they need in a flexible way. This results in less waste,



**Cost pressures continue to run high and it's hard to overstate the importance of efficiency-driven savings**

increased sustainability through a reduction in machine idle time and improved operational efficiency — two factors that greatly contribute to cost savings.

Production slotting, sequencing and scheduling workflows can be totally reimagined within the context of responsive digital systems:

- First, the order slotting or sequencing system takes in all the relevant restrictions and parameters that apply to a production run — including buildability and the precise details that will eventually go into delivering a finished product that meets the customer's needs.
- With this information in hand, planners can visualize different scenarios and their likely results, then choose the optimal path to a finished truck or automobile. This might involve some smoothing and stabilization.
- When new situations arise, the same system triggers a warning and the planner can initiate a rescheduling directly in the system. The same system powers a replanning process that helps manufacturers maintain value and keep order fulfillment on track.

Cloud computing and SaaS will become more important than ever



Improved visibility for slotting and sequencing flows helps planners stabilize the supply chain and reduce lead times, which in turn helps to improve throughput, reduce rework, decrease disruptions due to unforeseen parts shortages, and optimize set-up times. The result is improved productivity, to the tune of at least 5-10%.

Because lead times are shorter, manufacturers can then leverage this increased productivity for lower capital commitments and significantly reduced inventory. Because the supply chain is more resilient to disruptions, manufacturers can achieve cost reductions of up to 90% for events like unplanned special promotions. In addition, dispatchers and managers can spend much less time on task forces and strategic meetings when unexpected situations arise. Of course, all the optimizations in the world are only as valuable as their actual results. And measuring those results is critical. That's why vehicle manufacturers also need business processes in place to gather data for key performance indicator (KPI) tracking and report generation. In keeping with the kinds of digital advances described above, these would ideally be automated, giving planners the power not just to evaluate previous runs but to improve future plans. This, too, allows for dynamic adjustments, resulting in decreasing logistics costs and personnel costs by 10-20%, in addition to reducing costly special trips and emergency task forces.

## 4. How Decentralized Digital Systems Power Smarter Planning Processes

The evolution of business processes outlined in this guide may seem ambitious. This transformation represents a major change for manufacturing businesses that have been set in their ways for many years.

But this vision is achievable if the right logic is applied. Business processes need to be integrated with the right systems and technology if they're going to yield tangible results. These systems need to be uniform and consistent, to give users a shared vision of the entire supply chain. They also need to be built on future-proof technologies.

This means that innovations like cloud computing and software-as-a-service (SaaS) delivery models will become more important than ever before. Cloud is one of the most frequently cited pillars of Industry 4.0. The fact that it powers applications that are scalable and decentralized means that it can help manufacturers improve visibility across the board.

Of course, new systems shouldn't just be based on the latest and most hyped technology. Rather, they should be based on the right technology — i.e., platforms and systems that are truly future-proof and won't force manufacturers to update problematic legacy applications in a few short years. Cloud and SaaS solutions can power digital transformation by their very nature, because they can help reduce the kinds of silos that crop up when applications at different touchpoints stop integrating effectively.

Of course, the trick with any new system is balancing functionality with cost. Car, truck and heavy equipment OEM's makers don't want to lay out thousands of dollars for a shiny new system that doesn't actually reduce their supply chain costs significantly. They need close alignment between the systems they adopt and the cost-saving potential of the processes they support. It's helpful to have a set of defined KPIs to apply to any potential software deployment — keeping in mind that some technologies (heterogenous, decentralized and cloud) have been shown to reduce costs as much as 15-30%. Similarly, by reducing the pressure on their own internal IT function (including upkeep, upgrades and migration), manufacturers can achieve 15% lower costs compared to IT management that's entirely internal.





The right processes  
can pave the way  
for productivity  
improvements  
of at least  
**5-10%**

## Building the Right Supply Chain Structures

Whatever new technology and processes manufacturers adopt, their unique day-to-day supply chain realities will determine the extent to which they're able to actualize cost-saving improvements, operational efficiencies and other benefits. Technology-powered business processes can help identify production capacity optimization scenarios and opportunities for dynamic logistics rerouting, but if the right production and logistics networks aren't in place to support those optimizations, they'll remain purely hypothetical.

When you consider that the kinds of optimizations discussed here can help power cost savings of 10-20% in the form of reduced personnel needs and lowered logistics costs, the importance of the right network structures becomes obvious.

How do you know if you're putting the right network structures in place? It's simple: Is your network designed to maximize transparency? Is it set up to provide necessary data in a timely way? Can it adapt as new information and new situations emerge? Does it enable you to optimize logistics or production capacity to save money?

If the answer to those questions is "yes," then you've got the right structures in place to support a smarter, more future-oriented value chain. If not, you have some work to do when it comes to the arrangement, integration and connectivity of production plants, warehouses, cross-docks, trucks, hubs and other network elements. As the rate of change in the global supply chain continues to increase, the ability of vehicle manufacturers to make this a priority will be increasingly crucial for staying competitive.





There are a number of sustainable levers that can help car and truck manufacturers save costs as they transform their manufacturing processes:

1. **Increased productivity** via smarter sequencing, smoothing, throughput increases, avoidance of missing parts and rework through a more stable supply chain, reduction of set-up times/color changes, etc. Improvements of at least 5-10% are possible, and often much more.
2. **Reduction of capital commitment** through lower inventories/throughput times. Usually at least a 20% inventory reduction can be achieved, and possibly more.
3. **Flexible, dynamic adjustment of capacities** in the production and logistics network. (At least 10-20% cost savings are possible via decreased personnel costs, logistics costs, etc.).
4. **Reduction of logistics costs** such as special trips, additional handling in case of changes, etc. Up to a 90% reduction can be achieved for unplanned special promotions.
5. **Reduced expenses** for task forces, special meetings and escalations. In turbulent times, 30% or more of the daily work of dispatchers and managers goes into these activities. Digitalization positions manufacturers to eliminate or reallocate that effort.
6. **Reduction of IT costs** through heterogeneous and decentralized systems. Parallel developments can help remove redundant systems and cut high internal support costs. More than 30% cost savings are possible, depending on the initial state of IT systems.
7. **Reduction of internal IT operating costs** through cost-efficient, future-proof cloud systems — via reduction of running costs such as internal care and support, and reduction of costs and expenses for upgrades or migration projects. Usually at least a 15% reduction in IT costs can be achieved, compared to internal IT.

## 5. How Blue Yonder Supports Flexible Supply Chain Transformation

If all of the above sounds a little daunting, fear not! Blue Yonder has a number of proven solutions designed to support these efforts and more. Our solutions are engineered to promote transparency and drive lean transformations. We help our customers build out agile processes, systems and structures that are more resilient and less susceptible to disruption. The result is a dynamic approach to new challenges, and a comprehensive supply chain perspective that helps manufacturers better understand and manage costs. Truck and car makers need to find the best ways to pursue their individual missions, develop their core competencies, perform ongoing cost optimizations, and ultimately become more competitive in their industries.

That's exactly where Blue Yonder comes in: Our solutions work together in a flexible, modular way to give manufacturers the support they need to better understand what's happening under the hood of their organization. From there, manufacturers can leverage new levels of transparency for smarter, more flexible and more efficient operations — not to mention significantly reduced costs along with improved service levels.





## Learn More About Blue Yonder Solutions

Need to know more? Here are some additional resources you may find useful:

1. [How Blue Yonder is combating today's automotive and industrial challenges](#)
2. [Develop optimized production planning and scheduling for single or multiple plants](#)
3. Drive success with supply chain resilience and agility for [automotive and industrial industries](#)

[Speak to a Blue Yonder Expert](#)