White paper

o9 x genpact

# Digital supply chain transformation in the Capital Goods industry

# Summary


Overcoming today's challenges with tomorrow's capabilities

- **Creating a competitive advantage:** Inflation, geopolitical conditions and components shortages have created higher uncertainty for the Capital Equipment industry, making business planning more challenging.
- **Project-based supply chain capabilities:** Capital Equipment companies deliver complex projects driven by key cross-functional and interdependent milestones.
- **Complex and configurable products:** In the context of increasing product configurability/complexity, companies need to modularize their products as well as being able to anticipate material and resources required in planning.
- **Dynamic global footprints:** Capital Equipment supply chains must regularly review their global footprint to adjust to changing market environments.
- **Tackling supply chain operational challenges:** Integration of multi-tier supply chain and manufacturing stakeholders is key to successfully orchestrating operations.
- **Transportation and logistics:** Capital Goods supply chains must consider material flow and increasing complexity to control the balance between service and cost.

# Introduction

It is easy to celebrate supply chains when they pivot in adversity. Companies can **quickly shift their inventory** and operations using available resources and assets to ensure business continuity.

This is a great advantage when prior investments and actions create the necessary infrastructure. However, building this flexibility **involves investing in capital equipment** and improvement projects in advance.

But these capital projects are inherently complicated, involving highly configurable products with complex bills of materials. The planning horizon is far longer than other industries, with **execution windows of 18 months** against sales and operations planning horizons of three to five years.

The supply and demand volatility is substantial, too, with projects moving geographically **and configurations and regulations subject to change.** For example, quickly ceasing operations in one location, such as Russia, highlights the need for a more adaptable global supply chain footprint and dynamic product allocation. Environmental, social, and governance (ESG) requirements and global logistics challenges can have the same effect.

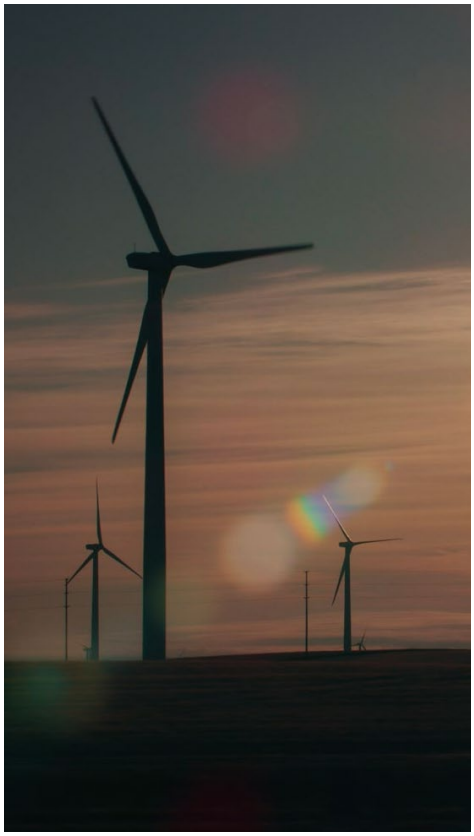
Capital projects are inherently complicated, as they involve highly configurable products with complex bills of materials.

Siloed processes and functions, and many disconnected IT systems, fail to prepare capital equipment supply chains for such circumstances. Focusing on manufacturing operations without upstream supplier network visibility (tier-two and beyond) often leaves manufacturers scrambling due to material shortages. Some leading indicators exist for supply and demand, but **they aren't robust enough** to be used in what-if scenario analysis.

Capital equipment manufacturers are **facing an inflection point** where they know that traditional supply chain practices cannot cope with future needs. Insulating with inventory isn't an option either, as it's cash-intensive and inefficient during volatile conditions.

# Overcoming today's challenges with tomorrow's capabilities

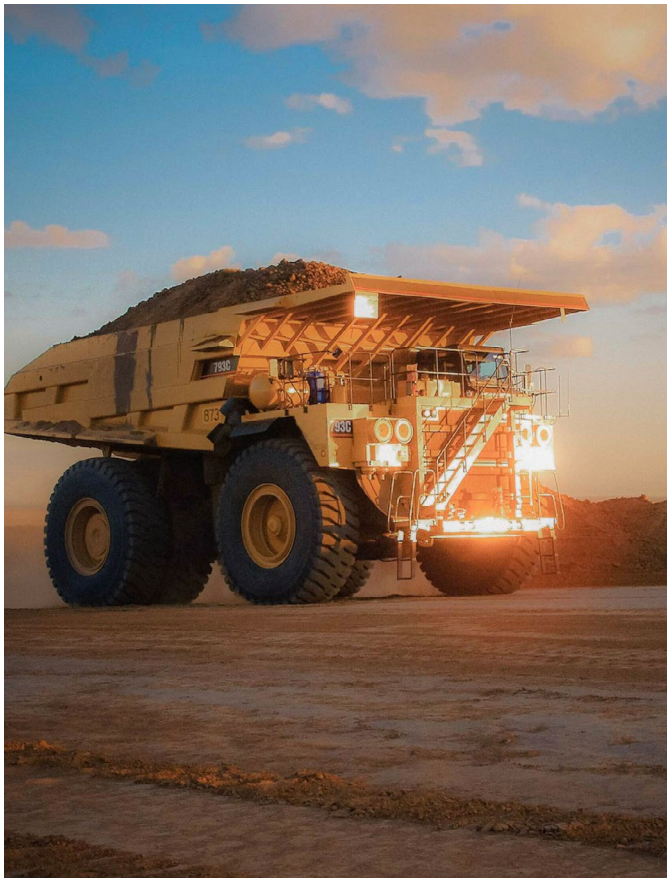
The capital equipment industry **needs to invest today to build the supply chain it needs for the future.** What is required is the overhaul of technology, process redesign, and people empowerment to transform strategy and planning.



Each challenge facing the capital equipment industry creates a set of **supply chain implications that impacts project execution.** Fortunately, the transformation to digital operating models enables companies to reinvent how their supply chains deliver value while enabling future flexibility, including planning solutions that integrate across multiple different sources, full data readiness, and a robust process vision.

The following sections outline how digital transformation enables capital equipment supply chains to **overcome their biggest challenges** in the industry today to be successful in the future.

# Creating a competitive advantage



The entanglement of economic, geopolitical, and regulatory factors magnifies market volatility for capital equipment supply chains and **increases the complexity of sourcing**, planning, and pricing of commodities and equipment components. The strategic pursuit of expanded aftermarket services and revenues is driving operating model changes, too.

As such, the post-pandemic capital goods industry must embrace **toward operational flexibility** and agility to boost resilience and responsiveness to unforeseeable changes in the business environment.

Capital goods supply chains should consider the following points to create a competitive advantage as customers expect better and faster value recognition:

- Scenario-based simulations and end-to-end planning capabilities are critical for capital goods companies **seeking profitability-oriented decision-making** that addresses concerns around projected P&L impacts.
- With capital markets rewarding companies with **clearly articulated ESG strategies**, environmental impacts (i.e., footprint calculations) and sustainability targets are essential in assessing scenarios and balancing demand and supply tradeoffs.
- Integrating the life cycle management process across parts planning, supplier collaboration, and **supply network optimization is critical to connecting the project and aftermarket** supply chains in any portfolio of complex and configurable products.

# Project-based supply chain capabilities

Each turnkey capital equipment project is highly complex. Every project milestone must be clear and managed with demand planning, production, procurement, and transportation teams evaluating each **decision's sizable cost-benefit and risk implications.** With this in mind, it's no surprise that heavy manual or semi-manual planning processes hinder organizational productivity, as do any existing limitations to cross-functional collaboration.

Capital goods supply chains plan resources, capacity, committed inventory, and demand on multi-year S&OP horizons. **In parallel, they execute in the S&OE horizon (12-18 months) and shorter.** Selecting and implementing suitable planning models between these S&OP/S&OE horizons is essential to building the proper framework to sense what matters.

Project-based supply chains should consider the following points to help manage complexity:

- Multi-tier planning capabilities, enabled by supplier connectivity and integrations, enable companies to **simulate the capable-to-promise** much faster, with key milestones and financial implications immediately visible to the process stakeholders.
- An integrated and collaboration-based planning process governed by a well-balanced set of metrics can **improve efficiency** through the following capabilities:
    - Dynamic assessment of demand fulfillment
    - Root cause analysis of unsupported demands
    - Coordination of project change requests
    - Managing supply issues
    - Reconciling regional planning and cross-functional inputs

# Complex and configurable products

The complex product offerings lead to expansive bills of materials that create substantial planning challenges on the multi-year S&OP horizon.

Configured-to-order and engineered-to-order businesses rely on design cycles specifically intended to address individual customer needs in creating unique product configurations. These complex product offerings lead to expansive bills of materials that create **substantial planning challenges on the multi-year S&OP horizon.** For example, capital equipment manufacturers must be able to intelligently anticipate which long lead-time items will be used in which products before final design approval so that they can begin procuring or producing parts.

Siloed systems and processes limit the ability of capital equipment supply chains to plan, make and deliver turnkey projects effectively. As such, the combination of advanced business processes and planning capabilities **enables a swift but detailed demand and supply** balancing mechanism to accommodate the dependency on engineering design cycles and specifications.

Capital goods companies should especially consider the following points when upgrading their planning for complex and configurable products:

- A key enabler for successful supply chain transformation is the **holistic integration of engineering designs and product specifications** with planning features such as time-phased configuration options.
- Leveraging planning bill-of-materials derived directly from sales specifications or detailed project management supports a high degree of adoption within a **reliable and scalable planning concept** in highly complex and volatile configure-to-order product environments.
- Supply chain flexibility, which is essential to support the underlying product innovation and the ability to customize products and components fully, should be modeled accordingly by creating a **digital supply chain twin for all associated dimensions.**

# Dynamic global footprints

Constantly changing market requirements mean capital equipment supply chains must regularly **evaluate their global manufacturing footprint** across a broad time horizon. Many factors can influence adjustments, such as cost and proximity to the market, external factors like political and economic tensions, and longer-term trends, such as industry cycles, demand softness, and shifts in regional preferences. ESG considerations are also becoming increasingly important.

Expanding global footprints usually comes at a price. The complexity of planning for a widespread and partially redundant manufacturing capability proliferates and **puts additional pressure on supply chain planning** to balance industry cycles with demand softness or shifts between regions.

Capital goods supply chains can use rough-cut capacity planning to create a globally constrained plan as a feeder into overarching footprint planning, then consider additional options such as:

- Network coordination and dynamic product allocation can help balance factors like **cost-effectiveness and available and capable capacity** if trade-offs are carefully evaluated and socialized with the stakeholders in the process.
- Supply chain transformation opportunities arise from an intelligent, embedded planning mechanism that can model, simulate, and assess the **various options using business-accepted metrics**, heuristic-based what-if scenario selections, or even Linear Programming-supported optimization approaches.


- Depending on the planning horizon, capital equipment supply chains must comprehensively model additional factors such as **confidentiality and expanding beyond the owned network nodes** into supplier tiers into the planning concept.

# Tackling supply chain operational challenges

Constantly changing market requirements mean capital equipment supply chains must regularly evaluate their global manufacturing footprint across a broad time horizon.

Capital equipment supply chains must shift toward a contractual-driven, technology-embedded system integration of multi-tier partner manufacturing. The degree of coordination, required visibility, and integration of systems and process landscape combine to become either a significant catalyst or **roadblock in successfully orchestrating operations.**

Traditional strategies to mitigate implied upstream (tier-one and beyond) stability risks via inventory management are reaching their limits due to limited cash funding abilities and the sheer number of parts and possible combinations that go into the various product configurations. At a minimum, capital equipment companies need a **stable, level-loaded production plan amidst an uncertain demand and supply** situation to take advantage of crucial operations principles like productivity, asset utilization, and workforce considerations.

Capital equipment supply chains should consider the following points to address their operational challenges.

- Successful supply chain transformation changes the planning focus from internal operations planning to **orchestrating a network of partners**, including a well-coordinated closed-loop of planning results into the tactical, more execution-focused level of the business.
- Collaboration is the **mission-critical key** for resolving potential planning conflicts with 1) a manufacturing level demanding stability to be (cost) effective and 2) suppliers and other network partners.
- Cohesive supplier risk management needs to be part of an end-to-end visibility planning platform capable of **leveraging the planning output** for performance monitoring and risk sensing beyond the tactical horizon.

# Transportation and logistics

The pandemic **significantly impacted global transportation and logistics.** In addition to assessing the manufacturing footprint, capital goods supply chains must evaluate how best to coordinate the flow of parts and finished goods.

Activities such as improving material flows, managing limited port capacity, differentiating transportation modes, assessing market proximity, managing direct shipments, redefining warehouse locations and shipment points and leveraging cross-docking, etc., **are now crucial for agile and adaptable manufacturing** and footprint considerations. Capital goods supply chains must weigh all of these factors into the balancing act of delivering and assembling projects on time and in full while keeping costs at bay, representing the bulk of the supply chain operational cost.

Key points to consider for advancing transportation and logistics capabilities in project-based supply chains are as follows:

- Simultaneous planning of manufacturing capacity and critical logistics constraints, like special vessel planning and load optimization, **can become the key driver** for cost-optimized planning.

- Assessing cost levers in S&OE and S&OP and providing advanced transportation visibility through control tower technology **provides key transformation opportunities** for the capital goods industry.

# Conclusion

o9 and Genpact work together to drive the digital supply chain transformation agenda of many Capital Equipment players bringing the best of **planning technology with global bespoke business transformation and thought leadership.** o9 is a leading Integrated Business Planning solution, providing unique capabilities in project-based planning. The o9 Digital Brain enables a true end-to-end Supply Chain transformation, **breaking silos for faster decision-making** while managing complex challenges the Capital Equipment industry faces.

Contact o9 directly to learn more about leveraging such a partnership to overcome your digital supply chain transformation challenges.

## About Genpact

Genpact (NYSE: G) is a global professional services firm delivering the outcomes that transform our clients' businesses and shape their future. We're guided by our real-world experience redesigning and running thousands of processes for hundreds of global companies.

Our clients—including many in the Global Fortune 500—partner with us for our unique ability to combine deep industry and functional expertise, leading talent, and proven methodologies to drive collaborative innovation that turns insights into action and delivers outcomes at scale. We create lasting competitive advantages for our clients and their customers, running digitally enabled operations and applying our Data-Tech-AI services to design, build, and transform their businesses. And we do it all with purpose.

From New York to New Delhi and more than 30 countries in between, our 115,000+ team is passionate in its relentless pursuit of a world that works better for people. Get to know us at Genpact.com and on LinkedIn, Twitter, YouTube, and Facebook.

## About o9 Solutions

o9's AI-powered Digital Brain platform improves planning and decision-making across the core supply chain, commercial, and P&L functions. It enhances data quality, detects risks and opportunities earlier, and matches demand and supply intelligently.

Supported by global partners, o9 delivers quick impact in customer service, inventory levels, resource utilization, as well as ESG and financial KPIs, while enabling sustainable transformation.

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Content and editors

**Philippe Wolff**
Global VP Industry Solutions
Discrete Manufacturing
philippe.wolff@o9solutions.com
Connect →

**Dipl. Kfm. Jochen Krätschmer**
Director Supply Chain Management
jochen.kraetschmer@genpact.com
Connect →

**Gurkan Sacikara**
Assistant Vice President Data-Tech-AI,
Manufacturing
gurkan.sacikara@genpact.com
Connect →



Design

o9 Design Lab


o9solutions.com