

Forecasting/Demand Planning
CHANGE

WHITE PAPER

**Structuring the Outsourced
Supply Chain Data Model**
10 Critical Data Issues to Consider

Global
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Supply Chain Simulation
Inventory
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SALES AND
OPERATIONS
PLANNING
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New Product Introduction
COLLABORATION
COST MANAGEMENT
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The New Normal: Complex, Outsourced Supply Chains

Outsourcing manufacturing to specialists who can provide unique value and drive down costs is now the business norm. While companies may be going about it with more caution and consideration than perhaps in the early 2000s, the manufacturing outsourcing model itself is not in question.

Today, most manufacturers have built very sophisticated, multi-tier and multi-enterprise supply chains consisting of distribution centers, contract manufacturers (CMs), suppliers, and the like. The once simple, linear supply chains of yesterday now consist of a virtual network of interconnected players responsible for different pieces of the supply chain management operation.

While brand owners may be able to outsource some operational responsibilities, they still remain accountable for their brand, quality, customer satisfaction and answering to their stakeholders. And with constant customer demand changes, new product introductions and engineering revisions, brand owners must still own key segments of the supply chain. So in an outsourced environment, what's needed is a balance where manufacturing operations are managed by CMs and suppliers, but brand owners actively coordinate activities across the virtual enterprise to ensure the desired outcome.

As brand owners turn to outsourced manufacturing, supply planning, monitoring and response becomes more and more complex. Where talented, trusted planners could once survey the shop floor, assess capacity and material availability, and develop or adjust supply plans, now there are far too many factors for an individual to keep track of.

Brand owners are quick to discover that the first critical impact of outsourcing is the loss of visibility of detailed supply – demand data that they once held in their own ERP systems. Without this visibility they cannot make information-based supply management decisions. While getting access to detailed supplier supply – demand data is usually their first focus, it soon becomes apparent that tools that can allow them to view, analyze, and manipulate this data are also a very high priority.

Achieving this level of supply chain visibility and coordination is no easy feat. It requires adopting technologies and tools that can:

- ▶ pull diverse sources of supply chain data across multiple systems (internal and external to the organization).
- ▶ provide high compute capabilities that allow rapid and deep data analysis.
- ▶ integrate with record-keeping transactional systems to facilitate action.
- ▶ enable multiple users to work simultaneously from a single real-time 'version of truth.'

Consider some of the factors that have contributed to the increasing complexity of today's supply chains:

- ▶ **Demand volatility** has increased radically; supply plans must be frequently reassessed and adjusted.
- ▶ The rate of **product introduction** has increased, and excess and obsolescent inventory has become a significant risk.
- ▶ Outsourced supply chains may be quite deep, with **more than one level of outsourcing**.
- ▶ **Alternate parts** may often be used to satisfy demands; criteria for use of alternates may be complex.
- ▶ Brand owners may have **strategic purchase agreements** with component suppliers which must be respected.
- ▶ **Alternate supply sources** are often sought to minimize risk; criteria for use of alternate suppliers may be complex.
- ▶ **Capacity agreements** are often in use with outsourced suppliers, and these must be respected in source selection, supply planning.
- ▶ **Yields may vary** across suppliers and must be considered in planning processes.
- ▶ **Inventory liability agreements** are often in place with outsourced suppliers, and inventory rebalancing across international sites is often an expectation as part of the supply plan.

Managing by Spreadsheets is No Longer Enough

Spreadsheets with site-specific data points are the normal starting point for many organizations. While many have come to rely on tools such as Excel as a way to extract, consolidate, and share data, the problem is that Excel was not designed for this particular purpose. It cannot manage the volume of data required; it has very limited modeling capabilities and it is difficult, if not impossible, to effectively and simultaneously collaborate with supply chain participants. The solution turns out to be quite time-consuming and cumbersome and rarely yields ideal results given its propensity to human error and inconsistent processes.

As well, to effectively leverage core operational data for global supply chain planning, monitoring, and response, it is not enough to model just the data at each supply chain node; visibility of supplier inter-dependencies and demand - supply flow across the network is required. For global performance management, one needs global visibility. A multi-enterprise, multi-tier view of manufacturing operations is required to have a full outlook of the business and to strategically manage the supply chain as appropriate.

Structuring of this data is a non-trivial task as the depth of supply chains increases, and spreadsheets are simply no longer enough.

What Do I Need?

There are competing objectives: keep the supply chain data model simple for ease of data management, but still accommodate all of the complex potential inter-relationships – factors that support simulation of demand – supply alternatives.

And once the data is in place, processes are required to:

- ▶ identify real or potential supply issues
- ▶ simulate various alternative courses of action
- ▶ evaluate these alternatives

This must all be done in collaboration with suppliers and/or customers in order to determine the most effective actions.

The following are ten critical data issues to be considered in structuring the supply chain data model for maximum utility.

Capture core data from partners

More and more frequently, outsourcing agreements include provisions for data sharing, which address both content and frequency of data feeds. Working closely with suppliers to understand the details of this data is a critical component of the collaboration process.

Top Ten Data Issues

Capturing Core Data from Partners

1. Part numbering issues
2. Core supply node master data and supply-demand details
3. Supplier constraints, both capacity and material based
4. In transit quantities, lead times

Modeling Contractual Terms

5. Tolerances, demand and supply changes
6. Inventory rebalancing expectations

Simulating Supply Alternative Strategies

7. Alternate supply plans
8. Supply sourcing: strategic end item selection
9. Supply sourcing: supplier selection
10. Metrics for supply plan evaluation

Part numbering issues

Part numbering schemes will usually vary across supply chain nodes. How will common or equivalent part numbers be established for global planning and netting? Cross-referencing supplier parts to brand owner part numbers is the most common approach.

However, it may also be necessary to consider parts in groups for netting purposes. For example, some suppliers may identify parts at the revision level, while others do not, or planning may be done at a product line level, not the detailed part level. System support for use of alternate parts and/or aggregation of supply and demand across multiple parts may be a critical requirement.

Core supply node master data and supply-demand details

Parts, bill of materials (BOMs), on hand inventories, local order policies, priorities, scrap and yield factors are usually required for each supply chain node, as well as all active demand and firm supply records. It should be possible to match the local planning behavior of the outsourced supplier reasonably closely. This becomes particularly important when there are multiple levels in the supply chain. Incorrect planning at one level can radically skew requirements for downstream suppliers.

Semiconductor manufacturing provides one example here, where wafer fabrication, assembly and test may all be handled by separate suppliers with potentially different lot sizing, lead times, and yield factors at each stage. Without matching each supplier's planning policies it would be impossible to accurately plan for product availability.

Supplier constraints, both capacity and material based

Suppliers may have shared constraint information, and sourcing may be constraint-based. For example, a supplier may commit to producing a fixed quantity per week of a specific part, or grouping of parts, or he may commit to a fixed percentage of available hours on a particular manufacturing line. If known, these constraints should be reflected in sourcing rules and should be adjustable by the planner for simulation.

In transit quantities, lead times

At any given point in time, a significant portion of the existing inventory may be in transit between supply nodes. Clearly, synchronizing the timing of data collection for all nodes, including in-transit quantities is critical, if data collection is not real-time. In practice, getting the in-transit data right is often one of biggest data hurdles and a clear understanding of how in-transit quantities relate to supplier commitments is mandatory. For example, are current supplier commitments net of in-transit shipments, or should commitments be decremented by in-transits?

Lead time information is normally available by supplier, but, when modeling the full supply chain, transit time between partners becomes more and more important to model cumulative lead time.

Model Contractual Terms

As demand fluctuates and supply plans are adjusted, it is important to be able to quickly determine if contractual terms are being violated.

Tolerances, demand, and supply changes

Outsourcing agreements often put limits on demand and supply change within specified periods to determine excess inventory liability. In the supply planning process, forewarning of potential liabilities is certainly desirable. By capturing these tolerances, planners can simulate different supply plans and evaluate demand and supply changes outside of agreed tolerances to provide some mitigation against excess inventory liability.

Inventory rebalancing expectations

Brand owners often expect their contract manufacturers to source component inventory from existing excess at other nodes before purchasing more. Rules must be understood so that inventory transfers can be simulated.

Simulate supply alternative strategies

Perhaps the biggest benefit of having this data model in place is the ability it provides to brand owners to simulate supply alternatives across the entire supply chain. While contract manufacturers and component suppliers are responsible for managing manufacturing operations, brand owners, with this visibility, can actively collaborate with them and ultimately coordinate activities to manage supply and minimize risks for all partners. A successful collaboration process will increase trust levels and ultimately strengthen the relationship between brand owners and suppliers.

Alternate supply plans

Product availability based on existing supplier commitments compared to product availability based on projected supplier capability using the supply chain model is often the starting point for analysis. It should be possible for the brand owner to simulate potential supply alternatives by:

- ▶ changing rules for end item selection
- ▶ changing sourcing rules for suppliers
- ▶ transferring existing inventories
- ▶ simulating other changes in planning policies, such as lead time

Planners can use those simulation results as the basis for collaboration with suppliers.

Supply sourcing: strategic end item selection

One alternative strategy to improve supply may be to change the mix of equivalent products that are planned. This end item selection can be complex in many environments. Item selection could be based on purchase agreements for strategic components, customer qualification status for specific end items, end-of-life plans for products, etc. Selection rules should be made visible in the data (perhaps as

part of the bill of material or represented as part to part transfers), so that planners can review and adjust them for simulation of alternatives.

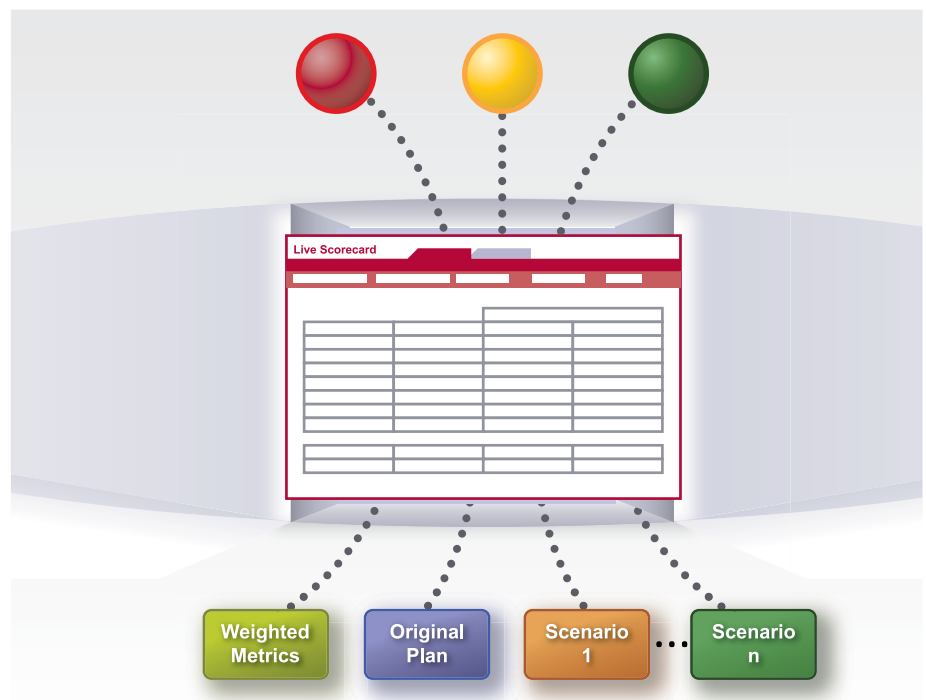
Supply sourcing: supplier selection

Use of alternate suppliers is one of the most common strategies for supply improvement. It is advantageous to be able to identify all potential supplier relationships, not just those currently active, if planners are to be able to simulate and evaluate potential supplier changes. For example, all demand may be sourced to a single supplier, but, in the event of a demand increase, the planner may want to simulate splitting supply across two or more sources, perhaps on a percentage basis, perhaps on absolute quantities, or perhaps based on supplier capacity. Rules should be structured in such a way that planners can simulate time-phased rule changes or can simply override supplier information on particular orders.

Metrics for supply plan evaluation

What makes an effective supply plan? Clearly the decision making process will be unique to an organization and will usually balance key performance indicators (KPI) relating to customer service, revenue, costs, potential liabilities. Change will be frequent, and it is important for brand owners to be able to respond to change by simulating supply alternatives and measuring the impact on the overall plan.

Building a set of metrics for this comparison of alternatives is a key component. Planners should be able to compare several alternate strategies before selecting the optimal one in the event of supply constraints. The impact of alternate strategies on KPIs should be able to be ranked and compared across scenarios to obtain a balanced scorecard and an objective way of determining the best course of action.



Is it Worth It?

Yes.

Increasing supply chain complexity is driving the requirement for more complex data models. The complexity can be overwhelming without the proper tools and processes in place. But the challenge cannot simply be ignored because it is daunting. The market is driving the complexity and companies are required to manage it.

For many organizations, current processes are unsustainable and unacceptable. To survive and thrive in this dynamic environment, companies must adapt. And while it is certainly not without its challenges, it is also not without great benefit when done right.

Once the supply chain has been effectively modeled, brand owners will have a powerful tool for:

- ▶ ensuring adequate, timely material availability throughout the supply chain – including the ability to respond to demand variability.
- ▶ simultaneously representing demand, supply, product and production capacity at all levels of the extended enterprise.
- ▶ supporting multiple layers of the supply chain simultaneously to understand changing end demand and supply conditions for all supply nodes.
- ▶ facilitating brand owner processes that have become extremely difficult with outsourcing (such as Sales and Operations Planning, Inventory Management, New Product Introductions (NPI), End-of-Life (EOL) optimization, product profit management) as well as new processes introduced with outsourcing (such as contract and inventory liability management).
- ▶ enabling reliability and consistency in business processes.
- ▶ ensuring all supply chain participants are working towards mutually beneficial goals.

Improving supply chain management through enhanced visibility and coordination can lead to numerous business benefits, including:

- ▶ reduction in inventory, increased inventory turns, and reduced carrying costs
- ▶ increased factory throughput
- ▶ lead time reduction
- ▶ coordinated introduction of new products
- ▶ more reliable delivery
- ▶ better forecasts

In the end, more effective coordination of the outsourced supply chain through a robust supply chain data model, improves customer service, and reduces operating expenses. Is that not a strategic necessity in today's unforgiving business environment?



ABOUT KINAXIS

Kinaxis delivers a comprehensive on-demand supply chain offering—RapidResponse—that enables manufacturers and brand owners to drive supply chain management (SCM) and sales and operations planning (S&OP) from a single system. Global leaders across a broad range of industries are using RapidResponse as a decision-making hub for the broader value chain and are realizing a competitive advantage as a result. Large manufacturing companies with complex supply chain networks and volatile business environments rely on RapidResponse for collaborative planning, continuous performance management, and coordinated response to plan variances. Learn more about the [RapidResponse](#) editions, or join the industry discussions on the Supply Chain Expert Community at: <https://community.kinaxis.com/>.

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