

# Automate and Optimize Production Planning One Step at a Time



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Non-connected, siloed data and rigidity of commercial production planning solutions hinder production processes for manufacturing and consumer goods businesses, forcing companies to resort to manual, error prone practices.

Why, after years of technology and process advances, is this still the case?

Data management is a large concern when you have multiple data sources that are often disparate and siloed. And the challenges multiply as soon as production managers look upstream to multiple providers of components and labor resources, and downstream to myriad contract distribution centers, third-party logistics providers, carriers and retail or production outlets. It's clear that existing supply chain management and supply chain planning systems cannot provide the right access to the data needed today.

The problem is with the state of the connective tissue needed to handle the torrent of data up and down the supply chain. It's brittle — either weak or undeveloped. Though business disruptions that flowed from the onset of the pandemic have contributed to this situation, they have also resulted from corporate mergers and acquisitions and the legacy patchwork of systems, data-collection methods and talent.

The result is an extremely complex ecosystem that defies a “clean” solution.

## **It's Not Rocket Science: It's Rocket Science, and Then Some**

Compare the management of a global supply chain to the design

and manufacture of a jet engine. It incorporates critical moving parts that must all be manufactured to strict tolerances, and then operated without failure, and most of the parameters for its operations are well defined. The manufacturer knows exactly what its engine is supposed to do and how it is going to be operated.

A supply chain is just as complex as a jet engine, and perhaps even more so, because supply chain design parameters are not so well defined. Fickle market demands, labor uncertainties, ever-changing networks of suppliers, unpredictable geo-political events and many other variables leave production and supply chain planners in a different and more difficult position. They must create data-driven optimization with underdeveloped and therefore unreliable access to required data sets.

This is true both for historic data and future data. As mentioned above, available historic data is often siloed and disparate. Future events and trends that may influence the supply chain can be anticipated to some extent, but data for future demand, labor, disruptions and more cannot be interpreted due to lack of connectivity between different players.

Supply chain data siloing continues to be a major issue across businesses, partially as a result of corporate acquisitions and mergers and the complex network of partners in any supply chain. Not only does siloing open the risk of unplanned changes and disruptions at any time in a supply chain but — worse — it creates a lack of data visibility into disruptive events.

A missed delivery of just one container to a production facility can create thousands of data touchpoints that, if not captured as real-time data, can cascade to create increased costs, lost sales, excess or obsolete inventory and unhappy customers.

Today's management systems and planning systems can only address these challenges to some extent. The focus should be on creating connective tissue that brings in and gives visibility and analytics to disparate sources.

## **Supply Optimization, Part of a Larger Fulfillment Effort**

A central, critical element to successful supply chain operations is fulfillment. On-time fulfillment is essential to assuring that products are available when and where the consumer wants them. Missing that opportunity is very costly.

And, successful fulfillment depends on connected supply optimization, which includes component positions such as safety/pipeline/cycle inventory. How confident can any business be with the accuracy of their production plan based on all of these variables? How can they know if there's room for improvement with a COTS solution if they are rigid? Data platform and smart data fabric is the answer.

For example, fill rates do not exist in a vacuum. Achieving optimal fill rates can take place only when fulfillment is part of a seamless, connected-tissue supply chain that incorporates an advanced data platform.

Solving these data integration problems might seem daunting, but it doesn't have to be. Data platforms are available that can become the connected tissue for the eventual elimination of data "chasms" that are currently hampering fulfillment and supply chain operations.

Starting with well-defined and manageable projects, successful and internal buy-in can be created to support an evolution of a company's supply chain over time to one that is driven by truly useful and reliable data.

The ultimate goal is to create an integrated supply chain with unified data that includes four key attributes:

- Consistent data, harmonized and normalized across available disparate sources and formats (relational, non-relational, streaming, etc.);
- Real-time data and analytics that ingest, process, and analyze data in real time without delay and at scale;

- Intelligent processes that enable seamless, accurate, connected supply chain orchestration and AI-enabled intelligent business processes; and
- Insights based on real-time advanced analytics — business intelligence, machine learning, automated intelligence, natural language processing — for descriptive and prescriptive insights.

### **Data Lake, or Swamp?**

Creating a healthy connective tissue will facilitate the data-driven optimization process and ultimately improve the fulfillment function. It will be informed by data from upstream, downstream, internal distribution, and manufacturing. Until now, all this has been spilled into a data lake that can quickly become a data swamp.

Simply gathering data is not enough. The problem with a data lake is the lack of harmonization of resident information to suit it for different data analysis tracks. Data is like a diamond in the rough: It requires significant governance and data manipulation efforts to bring it to the needed polish for business utility levels.

A state-of-the-art data platform complements existing data lakes, using data and analytical engines to make discovery more effective and approachable. This platform already incorporates advanced data science capabilities, including analytics, artificial intelligence machine learning and so on. Such a platform normalizes and harmonizes all incoming data, giving production and supply chain managers visibility into the data as a unified source of truth, with decision intelligence. With that visibility, production planning and fulfillment can be truly optimized.

It's important to keep in mind that off-the-shelf technology cannot instantly resolve the challenges of specific supply chains. Although most off-the-shelf technology works well in an unconstrained environment, most optimization will need to take place in a constrained environment. Reaching ultimate solutions will require a journey during which lessons learned will be applied to the next steps. In other words, it's not necessary (or useful) to try to assemble all necessary pieces at the onset. Rather, start by establishing a uniform data discovery layer and pull together all the relevant data and — once that is harmonized — paths will open to optimizing defined supply chain challenges one by one, with incremental improvements continuously encouraging next steps.

As an organization's data platform evolves, it will enable supply chain systems to better integrate with business partners via external visibility platforms and supplier networks. That platform will enable the most effective use of these valuable supply chain resources.

### **Food for Thought**

This approach is being successfully used by a Fortune 100 company that recognized the need to optimize their production planning to help increase fill rates. Accessing contextually relevant data from different/variant systems and getting it into one place had posed a problem. They needed to be able to get a cohesive data set from sales and demand resource planning systems and allow intelligence to be applied to it. The data needed to be normalized and harmonized, including inventory and demand, existing or foreseen inventory positions, and the mapping from the component to final product.

Production planning managers were creating weekly production plans using manual and Excel-driven processes, which was a time-consuming effort.

Acknowledging that their fill rates needed improvement to remain competitive, production planning managers participated in whiteboard sessions to document in detail the current production planning process to identify areas for process improvement. Various problems were identified, primarily centered around unanticipated events that were occurring. It wasn't possible to adjust the production plan quickly enough to adapt production to changes including equipment failure, missed deliveries from suppliers and sudden changes in e-commerce order volumes.

They teamed up with a data platform technology provider that could implement a required solution specific to identified need. A proof of value program was developed that that would initially run as a limited scope pilot before attempting a more systemic implementation.

The initial phase of the project was completed in six weeks, and improvements were immediately apparent. For one, the spreadsheet-driven open order planning process was eliminated. In its place was a real-time optimized production plan, digitally generated to line of business, that was ready to go at the start of the business day,

The harmonized and normalized data that continuously populated the solution platform, provided real-time visibility into important production metrics such as total demand, fill rates, the demand breakdown by product and category,

inventory positions, and shortfalls. More significant was the view into optimized production planning highlighting the projected fill rate based on the optimized production plan including inventory shortfall and production plan exceptions.

Fill-rate improvements of up to 10 points quickly created buy-in up and down the organization, opening the way for consideration of additional improvements using the new platform. Options are being developed that are expected not only to improve fill rates even more, but to optimize overall supply chain performance for the food products distributor.

This case demonstrates how to get started. It might seem like a small step, but it's important to get the ball rolling. A complete digital transformation for a supply chain will be a journey that starts somewhere, and the sooner the better because the process can be lengthy — on the order of three to five years.

### **Weaving Smart Data Fabric**

The benefits of engaging in a digital transformation can be great, while the alternative can be to see profits and market share erode, or worse.

Similar to the knitting of a sweater, this process starts with bringing together basic threads that already exist — including assets like enterprise applications, databases, data lakes, internet of things devices and logistics partners. These threads can be woven together into a smart data fabric, aka the connective tissue that provides integration, normalization and harmonization of data.

What makes the data fabric “smart” is its adaptability. The connective tissue/fabric is tightly woven in

some places and loose in others to provide better agility and responsiveness for every actor participating in or contributing to it. This strong, flexible and versatile net of connections supports organizations to optimize their existing investments using embedded interoperability, data exploration, AI/ML/AutoML, business intelligence/analytics, versatile and easy-to-use python programming, and natural language processing.

With the smart data fabric in place, an enterprise will have developed an innate ability to more accurately predict demand and supply chain trends supporting better logistics scheduling, increased capacity utilization, more products in the right place at the right time, higher sales and lower costs.

All this is likely to build brand reputation and customer loyalty.

In short, there's no reason to wait for the perfect solution. There's no time like now to start building a stronger enterprise with harmonized data for a stronger, more resilient decision-intelligent supply chain.

*Resource Link:*

[www.intersystems.com/resources/production-plan-optimization-for-repackaging](http://www.intersystems.com/resources/production-plan-optimization-for-repackaging)