6

Steps to Solving Your Supply Chain Challenges with Data

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make data matter

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Supply chain disruptions aren't new, but the past two years have been especially challenging. Disruption went up 150% year over year in 2021, thanks to a mix of operational bottlenecks, labor shortages, and a skills gap in manufacturing. All this led to a whopping 638% increase in the number of shortages in products and raw materials — everything from semiconductors to cardboard had a hard time moving through the supply chain.

The nature of any given disruption is often unpredictable — who would have guessed a cargo ship would get stuck sideways in the Suez Canal and back up worldwide shipping to the tune of $10 billion a day? The one thing we can predict is that there will always be disruptions, so supply chain organizations have to find ways to be resilient to upheaval.

That can be daunting when you're facing the fallout of major disruptions. Right now, every metric used to measure costs is way up, while every metric measuring productivity is way down. Every stage of the supply chain, from manufacturing to retail, is in a battle between absorbing as many costs as they can and choosing which costs to pass on to consumers.

In the midst of all this, many organizations still rely on Excel spreadsheets and heavily siloed data for forecasting and operations. While effective use of data can bring down operational costs and boost margins, scattered or incomplete data has the opposite effect.

The good news is, there are six steps you can take to get a handle on your data and ease your supply chain pains.

Understand Challenges and Define Business Objectives

As with most operational decisions and activities, your first step is to lay out your goals and priorities. Without them, you may end up focusing on initiatives that don't drive your business forward as quickly.

Creating a data-driven culture at an organizational level becomes even more complicated when teams rely on spreadsheets to gather and process business-critical data. If data comes from many sources, those spreadsheets can quickly become so complex that managing the data turns into a huge, chaotic chore.

"Businesses run on forecasting," says Gib Bassett, Director, Solutions Marketing and Industry GTM at Alteryx. "You have to make a huge number of decisions every day based on data from different sources."

If that data's unwieldy and hard to manage, forecasting gets that much harder. You'll have a tougher time seeing how well your forecasts have gone historically, what improvements you can make, and which of those improvements need to go to the top of your priorities list.

Here's one example of how getting a handle on your data can help you slash operational costs:
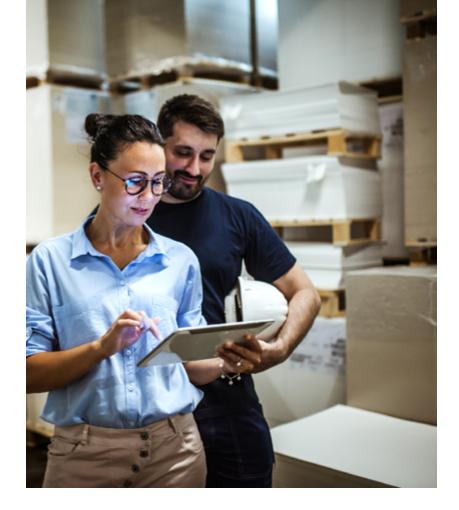
A subscription-based retail company ships boxes to 600,000 customers across the U.S. each week. It relies on a number of shipping carriers to handle the deliveries, selecting the carrier for each delivery by default based on the ZIP code.

The company wanted to optimize its supply chain operations and reduce shipping costs. With this business goal, it had to compare costs for different shipping methods and calculate based on variables other than ZIP code (like box weight and size). Using purpose-built software, it automated this price-checking process. It now runs the workflow once a week to make any necessary adjustments in carrier selection and chooses the most cost-effective option.

Maybe instead of shipping costs, your most important business objective is inventory management during high-demand periods and peak seasons. That was the case for a toy company whose demand shot up during the COVID-19 pandemic. With more people staying at home and looking for things to do indoors, the company had trouble keeping its big retail chain customers stocked with product.

Unable to keep up with the sheer volume of demand, the company had to answer tough questions like:

- Which products did it need to boost production on, and which could it reduce production on?

- Should manufacturing of some products be shifted between weeks?

- Which customers were likely to have orders it couldn't fill?

- Which products were likely to be out of stock at retail stores?

With huge volumes to manage, Excel would have been too unwieldy to handle the data needed to answer these questions. Automation again saved the day, using data analytics to optimize its operation.

These stories show how different organizations can have different priorities they need help solving with data. Defining those priorities and understanding challenges will help you chose the right objectives for your organization. Once you have your goals defined, your team can start working on a data management plan that will uncover business-critical insights.

Gather and Cleanse Your Data

Most organizations have a lot of disparate data systems and types of data to work with, such as sales data (how much product did we sell), shipments and orders data (how were these orders filled and on what timeline), and marketing data (how much money did we spend on our various campaigns).

Most of these data sources are in completely different systems — some may be in a database, some in SAP, some in Excel spreadsheets. To analyze anything and start making changes, you have to pull these pieces of data together so you have one cohesive picture.

Complicating this process is that the data is often not aligned across those systems. The catalog of products is often not standardized across systems, so product names are written slightly differently or have different SKU numbers or product IDs. Or maybe marketing has trouble understanding if a market aligns with sales because the sales data is slightly different. Lots of little misalignments can happen, making it harder to put all that information together.

If you want to know if your marketing campaign was successful, you need to understand the sales in those markets. This is not an easy task if sales and marketing data are not standardized across those two silos. Data pipelines can bring all that data together and align it into one big, central source that's matched across all these areas of interest.

"Building data pipelines is a combination of first connecting to and bringing in these various sources of information, then aligning them into one big resulting source that's matched across all these data points." – Razvan Nistor, Director of Data Science, CPG, and Growth at Keyrus

Pipelines are processes built to bring pieces of information in from all these different silos and piece them together to create a cross-functional view of data elements and metrics from each system. Once the data is imported, it has to be cleaned up to standardize data (like the product names mentioned above), remove irrelevant Excel columns, and fix other quirks of siloed data.

Network Modeling

A network model is a visual representation of the supply chain network that provides a clear picture of your product's journey to your customers. For example, a map showing all your warehouse locations and customer locations can show you the closest fulfillment center to your customer. This helps you decide which warehouse should ship each order.

That's not the end of routing, though. If you're choosing the distribution center based solely on crow-flies distance, you're missing a lot of nuances in route optimization, especially in crowded areas. **"Instead of asking, 'Where are my nearest customers?' you should ask, 'Which customers have the shortest drive time?'" says Nistor.**

For example, if you have a warehouse in New Jersey and you're shipping to Manhattan, you may have to cross the George Washington Bridge. Between tolls and heavy traffic, this bridge can be expensive and slow to navigate. Shipping from a warehouse north of New York City may be cheaper and faster.

Network modeling helps you understand the most optimized way to map a customer to a warehouse. Here again, this optimization is not readily accessible in Excel. It's much easier and more efficient with software that incorporates GPS to intelligently choose routes by shortest drive time, even if they're not physically closest.

Network Optimization

Once you have your network model, you can optimize your network. This includes shipping (discussed above), amount of inventory to hold, amount to buy from suppliers (whether it's raw materials or products from the manufacturers), etc. Optimizing based on your network model helps minimize your costs and the effect on your business while meeting all your customer demand.

> This optimization can save you a huge chunk of money. For example, a popular meal kit company wasn't choosing the lowest-cost method to get its packages to customers on time. By employing software that could grab data from carriers and compare rates to select the cheapest shipping option, it saved $30,000 per week. That's $1.5 million in annual savings, just by using network optimization to spot inefficient carrier selections.

And the savings don't just come from shipping — a lot of costs can also be reduced in warehousing and inventory. Your customers require a certain number of products, but that doesn't mean you necessarily need to hold, for example, a thousand LG TVs at a given warehouse. If you're projected to sell only 300, that's a huge overhead on the extra inventory.

Network modeling and optimization connect all the dots to get the right amount of inventory near the right customers. It tells you how much you should purchase at each warehouse, how much you should ship out, and how much inventory to hold there. It also shows you the associated costs to help measure performance over time.

Operational Planning

During the last few steps, you may have uncovered some challenges you need to address to get your operation running at peak performance. The next step is to use all that data to identify what actions you can take to make improvements and solve those issues. "The model is telling you the most optimized way to run your business," says Nistor. "Now you have to convert that into actionable plans and show stakeholders why they need to take these actions."

For example, in our warehouse scenario, the network model and data may show that a distribution facility in a smaller area should buy 5,000 units of a given product. The facility manager may be reluctant to purchase that volume even though the model says it's the most optimized way to run the business. Your network model showed that stocking this warehouse is the fastest way to move that volume to some customers, even though it's not the closest physically. If the manager doesn't have that information, they don't understand why they need to hold so much inventory.

To make good use of all the data you've collected and get it to the right stakeholders, you have to be able to pull reports so you can show that facility manager what the model says and why they need to take this action. It gives them the data they need to make intelligent business decisions, such as their purchase plan for the week.

Whether your reports are simple colored tables in Excel or more sophisticated dashboards in a software suite, you have to provide consumable data in a format that makes these planning activities more efficient.

Actionable Insights

Two big questions often arise from the network modeling and optimization activities:

- **Why is this happening?**
  Your model should give you the answer because it shows the patterns in the data on which you can base your decisions.

- **What can I do to improve?**
  With data in hand, you can run different scenarios to come up with ideas for optimizations.

Actionable insights come from interpreting the results from the model into answers to these questions. In our warehouse scenario above, you can answer the "why are we doing this" question with the data you uncovered. Ordering 5,000 units may be a net cost addition for that warehouse, but it lowers the overall regional costs by saving on intermediate-distance shipping fees. This wouldn't be an intuitive conclusion if they're only looking at their facility's costs and not the whole network view.

Network modeling also helps you simulate various scenarios to plan the best course of action. If our hesitant warehouse manager worries that this holiday demand will double instead of just going up 1.5x, you can show the patterns in the model to provide the best-estimated guess of what that demand will be.

The model can also turn up things like weather patterns that may affect shipping times, peak traffic periods, and distribution facilities that may ship a little slower so you can increase supply coming out of other facilities to compensate. All these insights help you make your case for why you're making each decision, and how the whole supply chain can work together.

From choosing business objectives to delivering actionable insights, these steps will help you get a handle on all the data from across your organization. With this beast harnessed, you can make better business decisions to cut costs, improve efficiency, and delight your customers.

About Keyrus and Alteryx

"The problems in the supply chain are well known. They're not new, though they were exacerbated by COVID-19 and disruptions across the board," says Nistor.

It's a new era, but the core problems that companies have always faced are still there: How can we monetize our data assets and inform our business processes? It's still not easy to do that; people have more data than ever, but there's still a capability gap when it comes to interpreting it.

That's where Keyrus and tools like Alteryx come in. They use your data to create workflows and applications that help you be more proactive with your analytics, and provide custom, flexible solutions that optimize time-to-value.

Even better, Alteryx is simple to use — if you know Excel, you can easily learn Alteryx. And because it's a low-code/no-code solution, you can build the workflows that make the most sense for your organization's needs. Got an out-of-the-box solution you're currently using? Alteryx can easily be added on to help you solve more complex issues without completely replacing your existing platform. Instead of requiring long lead times and multiple people to analyze data, you can automate much of the process. This helps you adapt more quickly to disruptions and perform better forecasting to meet changing customer demand.

Getting a handle on your data can be an intimidating prospect, especially if you're using complicated Excel sheets and collecting information from many sources. By putting the above steps to work, you can tame your data to make better business decisions across your whole operation.

Meet Keyrus

Keyrus is a global consultancy that specializes in the development of data and digital technology solutions for performance management. Our team of experts "makes data matter" by helping companies turn their data into valuable business insights.

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