How to Calculate Inventory and Service Level Improvements from Supply Chain Planning Software

Start Here to Build a Strong Business Case for Planning Software

The disruption we've seen in supply chain planning as a result of the pandemic is unprecedented. Perhaps you are among the many companies that have learned the hard way that traditional planning methods fall short as market and demand volatility increase. Having the right supply chain planning technology is one way businesses can create efficiencies that free up cash in the near term as well as help build greater supply chain resilience for future disruptions.

An evidence-based business case for executives is critical to win approval for planning software investments. Not sure where to start? In this brief we lay out a simple plan for how to estimate potential supply chain KPI improvements including both hard numbers and "soft" benefits.

"Supply chain planning (SCP) software is critical to driving profitable growth and providing agility in an ever-more-competitive and fast-paced environment."[1]

Step 1: Identify Goals and Metrics Critical to Your Business

A good first step on this journey is to evaluate the goals and metrics that guide your operations and underscore your competitive advantage. Find the answers to questions like:

- What supply chain metrics (inventory size, working capital) are most important to the organization? Who is responsible for them?
- Do you have any service level agreements (SLAs) with large customers? What are the metrics and targets? What are the pain points the organization would like to eliminate? Are these tied to any of the components above? For example, ToolsGroup customer Granarolo produces dairy products and their problem was limited residual shelf life once a product had been stocked on the shelf. Reducing inventory resulted in the products being delivered fresher, giving them a longer shelf life in stores.
- Is there a target trade-off between inventory size and fill rate to achieve? (I.e. reduce inventory while maintaining existing fill rates, achieve a specific service level while minimizing inventory, or improve both inventory turns and fill rates).

A strong SCP business case must explain how planning capabilities will directly impact executive-level objectives.[1]

Step 2: Decide Where You Want to Improve and Estimate Impact

Once you have the answers to these questions, shift your focus to areas of opportunity within your organization and build a plan to improve your supply chain performance and align teams. We've identified three areas where a supply chain planning solution can have a huge impact on metrics your executive team cares about:

1.Customer service level improvements (commonly three to five percentage point improvement)
2.Reduction in finished goods inventories and associated costs (commonly 20 to 30 percent improvement)
3.Reduction in supply chain disruptions and associated costs (commonly a 50 percent improvement)

Service Level: How to Calculate Annual Benefit

Annual Benefit = Annual Sales X Service level improvement X Gross margin X Lost sales ratio

- We define **annual sales** as the annual sales of the inventory we are optimizing, whether it be a division, region, product line, etc.
- **Service level improvement** typically ranges from three to five percentage points, but can be higher if the company currently is achieving less than a 90 percent service level. One rule of thumb is that you should be able to reduce stockouts by half and still achieve some inventory reduction. To break this down, a company that is achieving a 90 percent fill rate, we should be able to improve to 95 percent, a five percentage point improvement. A company that is achieving a 96 percent fill rate, we should be able to improve to 98 percent, a two percentage point improvement.
- **Gross margin** should ideally be specific to that part of the company we are working with, but the corporate gross margin may be used as a substitute. This additional revenue carries only direct costs, therefore the entire gross margin is added to the bottom line.
- **Lost sales ratio** is that portion of sales that are lost when the product is out of stock and not available. Typically, branded products have a 40 percent lost sales ratio, meaning that 40 percent of the time that the company is out of stock, customers will choose a product from another company, rather than wait or buy a different product that the company offers. Among consumer products companies a lost sales ratio of 28 percent is considered close to best-in-class. Commodity products usually have much higher lost sales ratios.

An example benefit calculation for improved service level would look like this:

$ 300 million annual sales (for this division and region)
x 2% Service level improvement
x 50% Gross margin
x 40% lost sales ratio

= $1.2 million annual net profit improvement

Inventory Savings: How to Calculate Annual Benefit

Annual Benefit **=** **Inventory** **X** **Inventory Reduction** **X** **Inventory Carrying Cost** **%**

- We define **inventory** as the total monetary value of the inventory being optimized.
- The **inventory reduction** percent can vary widely depending on the application and on how much improvement in service level is targeted. Customers' past results have ranged from 10 to 50 percent. Inventory improvement will relate inversely to service level improvement. Applications with little to no service level improvement will have larger inventory improvements. Applications with large service level improvements will have small inventory reductions.
- **Inventory carrying cost** percent should be the sum of both cost of capital and the operational costs associated with carrying the inventory.
    - In a low inflation environment, a typical cost of capital is eight to 10 percent.
    - Operational costs vary greatly depending on the product. Products with high obsolescence (e.g., fresh food, electronics) should have high inventory carrying costs. Products which require expensive warehousing (refrigerated foods, dangerous goods) will also. A low operational cost may be five percent, but can be much higher. Operational costs may also be expressed not as a percentage, but as a function of volume, cases reduced, or any other measure.

Total inventory carrying cost percent (cost of capital plus operational costs) is rarely below 15 percent, and can be much higher. An example inventory savings calculation would look like this:

$ 200 million finished goods inventory
x 10% expected inventory reduction
x 15% total inventory carrying cost (cost of capital + operational costs)

= $3 million annual inventory carrying cost savings benefit

Fewer Supply Chain Disruptions & Improved Productivity

It's tempting to focus solely on tangible metrics such as inventory, lost sales, and profit margin. However, supply chain planning investments can have additional benefits that impact the bottom line, yet are harder to quantify. They can be unpredictable and incremental, and will vary greatly from company to company, but can be significant nonetheless. These include:

- Reduced premium freight costs from expediting fewer shipments
- Fewer set-ups in manufacturing
- Less overtime
- Freed-up cash from inventory that can be funneled back into the business
- Less exception handling required by planners and more time to focus on driving business value. This can allow the same planners to cover a much broader set of products. It's common for ToolsGroup customers to see a 50 to 90 percent reduction in planner workload.

Investigate Other Companies' Experiences

Raw metrics go a long way in justifying investments. However, numbers often have a deeper impact when they are part of a story incorporating examples of other companies that impacted key KPIs with supply chain planning software initiatives. Here are just a few to share.

- **Polaris** customers want their products now—whether it's parts for agricultural equipment or an impulse purchase of a personal watercraft. With volatile demand and high service expectations often comes excessive inventory levels. With probabilistic forecasting and stock mix optimization, Polaris has seen significant improvement in critical performance indicators that have turned the company around. In just two years it has reduced inventory by 15 percentage points and improved service levels by 10 percentage points, with significant improvement in planner productivity.

- **McDonald's Mesoamérica** needed to meet exceptionally high service levels while managing perishable products and dynamic promotions. A move to service-driven planning enabled the fast food giant to reduce inventory by seven percent, push service levels above 90 percent, reduce expedited shipments between stores by a whopping 83 percent, and significantly improve planner productivity and time management.

"ToolsGroup as software and an asset, it has been a great tool. It gives you great visibility of the whole inventory. It's predicting the forecast as has never been done before, and it has fantastic visual tools that the team is using to make some decisions."
— Rafael Labbé, Supply Chain Director at Suministros y Alimentos, a distributor to McDonalds Mesoamérica

- **A multi-national coffee bar company** used POS data, telemetry and rapid re-planning to enable an entirely new approach to logistics and replenishment, redefining the ability to deliver barista-quality coffee in thousands of venues that were previously impractical. Further, one planner handles the planning for 5,600 points of sale. These unmanned coffee stations transmit POS data every 15 minutes to help a highly autonomous planning system forecast demand, optimize inventory and generate replenishment proposals for distribution and procurement. This innovative model is generating new revenue streams at minimal costs for the retailer.

- **A pharmaceutical firm** developed the intelligence to identify potential stock-outs up to four months in advance. This gave them enough time to respond proactively to critically important customer demands. The automated statistical forecasting system is now consistently up to 20 percent more accurate than the company's own market intelligence.

"We're now at the point where we can confidently switch off our manual overrides and put complete trust in the forecasts."
— Executive Director Supply Chain

Look Beyond Quick Wins for Lifetime Value

Regardless of company size, industry, or customer segment, supply chain planning improvement initiatives are crucial to a larger strategy of competitive market advantage, enabling you to work faster, smarter and more accurately to improve the bottom line. Implementing a supply chain planning solution can support these goals to yield a transformational impact.

When you become a ToolsGroup customer, we bring all our teams' expertise together to develop and implement solutions aligned with your business objectives. With our support you can identify and execute methods that deliver sustained business value.

[1] How to Build a Strong Business Case for Your Supply Chain Planning Technology Investment. Alex Pradhan, published 7 June 2019.