Does Supply Chain Management Software Make Sense in Wholesale Distribution?

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Executive Summary

Growing competitive pressures compel strategies and tactics that yield efficiency and efficacy within virtual supply chains. This is especially true for middle-tier suppliers. For example, distributors are finding that they need managers who are not only good expediters and know their products, but who also understand how to use decision support tools to make their work more effective. Advances in information technology now make it more feasible for distributors to adopt such tools, including supply chain management software. This paper examines the steel service center segment of the wholesale distribution industry as a case in point of the challenges facing distributors, and the relief offered through supply chain software.

Distribution Evolves

In many ways, steel service centers (SSCs) typify the evolution of wholesale distribution in general. Historically, wholesale distribution has remained on the trailing edge of the information technology curve. It has been more important to focus on other priorities. For example, steel service centers have advanced quality and precision in processing and handling steel.

Like many sectors of wholesale distribution, SSCs have found a niche in the supply chain because they provided a way for smaller manufacturers to buy products when they could not effectively negotiate with large, powerful suppliers. In the case of steel service centers, these suppliers are the integrated steel mills.

Many SSCs started as brokers, buying low and selling higher. But that provided little barrier to entry, no competitive advantage, and margins that could not be sustained. In an effort to differentiate themselves, many SSCs have progressed up the value chain, adding steel processing to their product/service bundle. Other types of distributors have incorporated value-added services that are appropriate for their own customers.

Software Matures

Supply chain planning software applications emerged on the market about 25 years ago. The applications have improved, the technology on which they have been built has become more available, and the architecture has become more open. The first companies to appreciate the

potential of such applications were the most sophisticated in terms of their supply chain planning. These also happened to be larger companies who had significant IT budgets and expected to invest in these areas.

About 20 years ago, I wrote forecasting and inventory models in spreadsheets for the steel service center where I worked. It required hours—if not days—to key in the required data, which only became available once each month. At that time, these tools challenged the old, familiar decision-making processes of some of my colleagues.

Such decision tools are now commercially available "off the shelf." The Internet provides "anywhere access" to applications that are so enabled. Advances in technology now ease the integration of these decision tools with back-end transaction systems, even those used by many steel service centers. This means faster, more accurate results for managers who now know more about how to use them.

Industry Structure

While supply chain management applications have proven themselves in the real-world use of operations management theory, competitive pressures continue to grow even more intense, particularly in distribution and in other middle tiers of supply chains. Managers in all industries have become more knowledgeable about how to manage supply chain issues like service and inventory investment. They are learning that mathematics can help decision makers do their job by making recommendations and then allowing them to focus in areas where their judgment and experience are needed most.

OEMs are placing increasing pressure on their vendors to bear more of the risk of time and money in the total supply chain equation. Vendors, including steel service centers, are being asked to hold inventory, thereby assuming the lead-time risk and the risk of investing working capital. They are being asked to do this while maintaining, or even lowering, the amount that they charge the OEM for the product/service bundle.

The extended supply chain—all of the organizations, resources and processes that are required to meet customer demand—is much like a balloon, with the air inside representing time and money (cost). On the one end, OEMs compress the "balloon" so that the burden of time and money is pushed toward the middle. In some industries, the first-tier vendors can push some of this additional burden on to their own suppliers—in essence, compressing their part of the supply chain balloon, forcing the burden of cost and time on down the line.

However, in the case of steel service centers, not only can they not pass this burden of cost and time on to the steel mills, but the mills squeeze the "balloon" from the other end, compressing time and money out of their portion of the virtual supply chain onto the steel service center.

All of this squeezing of time and money from one part of the supply chain to another occurs without ever reducing the total supply chain cost. In order to survive, the member of the supply

chain on the receiving end of the "squeeze" will eventually have to find an outlet for this increased pressure. Too often, for a wholesale distributor such as a steel service center, this time and cost pressure shows up in red ink or lower margins on the income statement. The supply chain equation is a zero-sum solution over time. Simply moving costs around will not make the value chain any more profitable or effective over time. Unless the total volume of cost and time in the "balloon" is reduced instead of merely shifted, it must eventually be passed on to the end customer or absorbed by one of the links in the supply chain.

Passing costs on to the end customer or delaying final shipments is often not possible. For example, automobile manufacturers mandate cost decreases from time to time and penalize suppliers for late shipments. The only other option is for one or more partners to lose out through decreasing margins. Over time, this will force the disadvantaged partner to reduce investment and become less competitive. In the end, that trading partner will be replaced by a competitor who may face the same fate.

Structural Challenges

The steel industry presents some structural challenges for service centers that illustrate those faced by other distributors. Customers and mills have more relative bargaining power than service centers. That structure is not likely to change soon. However, the path to increased bargaining power within that challenging structure, as well as the road to survival, lies through a better way to manage the burden of cost and time that is being pressed on the SSC by the other trading partners. The steel service center must manage this cost and time more effectively than either its trading partners did or its competitors can. Essentially, this is taking some of the total time and money out of the supply chain equation-like letting air out of the center of the "balloon" that is being squeezed from both sides, making the entire supply chain more competitive than alternative combinations of trading partners.

The exciting part of this challenge is that nearly all of time and money that the steel service center can release from the supply chain "balloon" will go directly to its own bottom line.

The Critical Objectives

As anyone in the wholesale distribution business knows, there are some objectives that are critical to removing time and money from operations and enhancing competitive advantage. They include

- optimizing inventory investment,
- ensuring service,
- sourcing effectively, and
- maximizing return on assets

The structure of the steel industry provides a detailed perspective for examining the special attention that distributors must pay to these objectives. While steel service centers face some specific concerns, many of the challenges pervade the distribution business in general.

Optimizing Inventory Investment

A small proportion of the inventory will have some consistency in demand, but for the bulk of the SKUs, demand will often be lumpy or intermittent. Not all steel of a given dimension will have the same quality or properties. For example, hardness, tensile strength, and surface quality may all vary. Inventory supplies for various end uses must have the appropriate properties associated with quality. The inventory is heavy and expensive to transport, so movement should be minimized. Not only must steel service centers manage unprocessed steel (plate, coil, bar, etc.), but OEMs are increasingly asking their steel service centers to hold processed materials (slit coil, cut-to-length, plasma cut patterns, etc.) for just-in-time delivery as well, increasing pressure on margins and taxing their ability to manage inventory.

Ensuring Service

Achieving the key milestone of quality service remains a non-trivial problem. Simply increasing overall inventory levels is not only unprofitable, but also ineffectual. The right inventory of the appropriate quality needs to move to the right place, at the right time, and at the right cost. This means that raw material purchases must be carefully timed and allocated to the service center locations. Processing schedules must be reliable and flexible. Finished goods inventories must be managed for extremely short delivery lead times and for exacting quality standards. Outbound trucks have to be scheduled precisely, loaded efficiently and routed optimally. Naturally, all shipments should be closely tracked.

Sourcing Effectively

Careful planning must coordinate purchases with mill rolling schedules while synchronizing supplies with projected demand. Challenges exist here because mill schedules are inflexible and result in relatively infrequent delivery opportunities. As a result, service centers will often need to hold significant levels of inventory. Mill purchases may need to be supplemented with opportunistic purchases from other service centers. Achieving the right blend of procurement opportunities is crucial to profitability and a very significant challenge.

Achieving Return on Assets

Very expensive, precision equipment is required to handle and process steel. While machines often have some overlapping capabilities, different machines that perform the same function cannot necessarily process the same order. Machinery with more exact tolerances must be used for certain end applications. Also, similar machines often have different processing rates. These factors must be considered when planning long term capacity. If too little capacity exists, then the service center may not be able to respond

quickly to changes in demand. If too much exists, then the investment is not producing sufficient return.

Equipment considerations must be carefully, but quickly, evaluated when scheduling operations. Setups should be considered. While separate setup stations are sometimes used to build the setup for the next run, setup time may still be reduced through sequencing jobs in a manner that simultaneously considers tradeoffs among total setup time, demand priority, order due date, penalties for being late, and inventory risk.

Meeting the Objectives with Supply Chain Management Software

Thoughtful use of information technology enables successful business processes for inventory management, service assurance, return on assets, and effective sourcing. For example, the process of anticipating customer or marketplace requirements, often called "demand planning," is performed informally or formally by every business. The more accurate and collaborative that this process is, the more likely that purchasing and resource allocation will be in line with actual customer orders as they occur.

Demand planning software provides mathematical forecasting techniques that deal with seasonal, intermittent, lumpy, and trending demand. It can also facilitate different perspectives on forecasts, as well as historical data, at various levels within multiple dimensions such as product, geography, channel, and customer. Equally important functionality gathers inputs to the forecasting process from sales, operations and even customers, lending validity to the final result. This, in turn, helps assure service and avoid waste in the sourcing process.

Purchasing and scheduling business processes can be enhanced through software that can leverage mathematics behind the scenes to perform sophisticated inventory planning that is presented through simple, easy to use screens. Applications are available that can evaluate tradeoffs between the risk of disappointing customers and the risk to working capital through investment in inventory. The resulting calculation determines the best stocking quantity and location at a very detailed level or at an aggregate level.

A well-architected supply chain solution aligns distribution and transportation planning with scheduling and purchasing so that all the supply chain decisions are synchronized. These capabilities increase the return on assets by making sure that the right product is processed at the right time to meet metrics like inventory turns and gross margins. Sourcing and inventory levels can be optimized to enhance the bottom line.

The process of promising orders to customers is a critical piece of ensuring service because it sets the expectation against which the service center will be measured on each individual order. Applications exist today that enable 24/7, real-time order promising that considers not only inventory that is on hand or on order, but also available processing capacity and transportation capacity.

Technology Creates Opportunity

This kind of technology can remove both time and money from the total supply chain "balloon," creating opportunity for higher margins. In recent years, it has begun to be widely adopted across many industries. The technology has advanced over time so that the capabilities are more powerful, easier to use, and integrated. It has also evolved to be more open so that it can be used with the systems on which many steel service centers run.

Because of the power to enable the business processes that impact inventory management, customer service, return on assets, and sourcing, software applications in supply chain management are very appropriate in steel service centers and throughout wholesale distribution. Because the technology has become easier to implement, use, and maintain, many of the challenges to achieving the benefits that these applications can provide have been removed.

Figure 1 summarizes how the capabilities of a supply chain management software application can positively impact the four critical business objectives for steel service centers.

	Inventory Investment	Customer Service	Effective Sourcing	Return on Assets
Collaborative Forecasting	☑	☑	☑	☑
Inventory Optimization	☑	☑	☑	
Synchronized Planning		☑	☑	☑
Accurate Order Promising		☑		

Figure 1. Causal metrics matrix

Conclusion

The pressures on the bottom line for steel service centers have not weakened in the years since I worked in that industry. These challenges largely prevail throughout wholesale distribution. The technology is available, and the implementation path proven, that can help manage the four critical success factors (inventory, service, sourcing and ROA) within this context. Decision support tools such as those that help optimize inventory and service will improve margins significantly for SSCs as well as for other distributors, as they have for manufacturers. Supply chain planning software is one of the tools that can be used to release some of the time and money from the supply chain "balloon" to the bottom line.

About the Author

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Editor's note: *This article was originally published in three parts, at www.technologyevaluation.com.*