



SupplyVelocity®

Important Qualitative Supply Chain Decisions

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Important Outward-Facing Supply Chain Decisions

- What is Supply Chain Management?
- How is it different than Logistics?
- Why is this paper called “Qualitative” Supply Chain Decisions?

In a prior white paper titled “Important Quantitative Supply Chain Decisions” I stated that quantitative decisions could be considered “logistics” decisions. In addition, these decision are often (but not always) inwardly facing to the firm that is making these decisions. This is, of course, an oversimplification. However, it does help me think of the difference between supply chain management and logistics (which is usually considered a subset of supply chain management).

Simply put, logistics involves mostly quantitative decisions made by a firm regarding how it will produce, ship and store materials (raw, work-in-process and finished goods). Supply Chain Management can therefore be considered the outwardly facing decisions a firm makes with regards to its supply chain partners. Often these are qualitative decisions meaning they are not clear-cut cost minimization, profit and customer service maximization or risk mitigation decisions.

To help everyone understand the full scope of Supply Chain Management we provide our definition below and some graphics on the next page. In addition we define Supply Chain Management as:

- Supply chain management coordinates the flow of products, information and money from suppliers, and their suppliers, through a company to its customers, and their customers, with the purpose of serving customers and maximizing profit.

In the remainder of this paper we will briefly review six qualitative supply chain decisions we recommend you make or be aware may be impacting your business.



- Designing the right supply chain for your products (Lean, Agile, Lean/Agile hybrids)
- Trust and collaboration amongst supply chain partners
- Information technology in supply chain management
- The Bullwhip Effect – reducing demand variation from customer to suppliers
- Aligning suppliers, internal operations and customers
- The hierarchy of strategic, tactical and operational supply chain decisions and downstream effects of higher level decisions

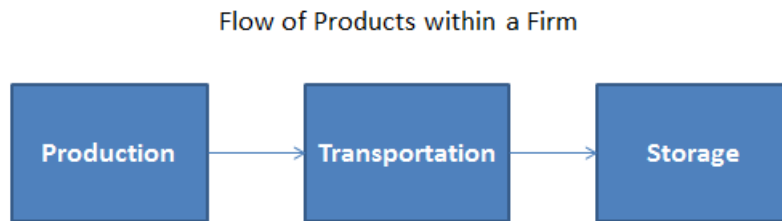


Figure 1: A Logistics Decision Network

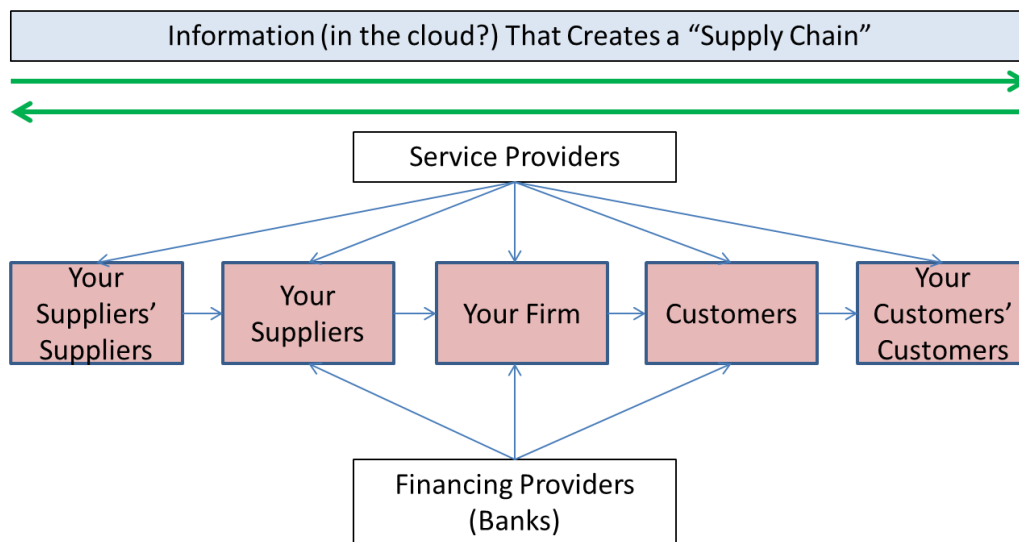


Figure 2: A Supply Chain Decision Network



Designing the Right Supply Chain for your Products

- Lean (pull), Agile (push) or AgiLean (push/pull)

(You can find a full description of “Choosing the Best Supply Chain for your Products” on www.supplyvelocity.com's white paper page.)

Depending on the nature of your products and services you may need a Lean, Agile or hybrid AgiLean supply chain. Lean supply chains will generally be best if you need to compete on cost and demand is relatively known. In this scenario you produce or buy to order with the focus on cost and inventory minimization. The classic example of a product that needs a Lean supply chain is commoditized food products. These supply chains turn inventory very quickly, and because of thin profit margins, are always focusing on cost reduction.

Agile supply chains will generally work best if price is not the critical decision factor and the loss of meeting customer demand is significant. These supply chains produce or buy to stock. Many items that are sold through stocking distributors require agility. A good example of this is spare parts. The cost of not having these products when needed can be far greater than the cost of holding inventory; and customers are usually willing to pay for this agility.

A third, and very popular supply chain design, is a hybrid called AgiLean. (I know it is a bit corny, but it is actually a good description.) In this design you produce or buy to order at a certain level in your product structure. This inventory is stocked and then the supply chain converts to produce-to-order. Technology and fashion products will often use AgiLean; raw materials or components are stocked, but the final configuration depends on specific customer demand. Products can be designed for AgiLean by utilizing postponement, modular design or mass customization. In this scenario the parts are stocked with the customization happening at the very end of the product structure or in the way modules are put together.



Other helpful terminology is push, pull and push/pull. Lean supply chains use pull inventory management and production systems. Pull systems start with the customer. Customers begin the purchasing or production process by placing their order. Agile supply chains use push system. Push is based on forecast where production and purchasing are decoupled from customer demand. AgiLean uses a push/pull combination with careful attention paid to the push/pull boundary. This boundary is the place in the product structure where the AgiLean company would stock materials or components to be produced, assembled or packaged to order.

Trust & Collaboration

- Ways to Collaborate
 - Product development
 - Demand forecasting
 - Vendor managed inventory
 - Joint promotions
- When Collaboration makes sense
 - 80/20 customers and suppliers
 - Strong technology capabilities
 - Customers and suppliers do not belong to competitors' supply chains
 - Trust!

(You can find a full description of “Trust & Collaboration” on www.supplyvelocity.com's white paper page.)

As a professional field, supply chain management only exists because of the concept of trusting and collaborating with your supply chain partners. If not for this concept, logistics would have done a fine job in describing our field. However, as information became easier to share (see next Section IT and SCM) logisticians, schedulers and purchasing managers realized they could coordinate activities with suppliers and customers. This short description will review ways to collaborate and when it makes sense to pursue this strategy.



Collaboration is most often realized in joint product development, forecasting, vendor-managed inventory and joint promotions. (We should be careful to state that it is not limited to these areas.) Joint product development means handing over key aspects of a products technology or functionality to suppliers who have the core capability. Instead of competing on price, a cost is set and the suppliers provide the best technology, features and functionality for that price.

Joint forecasting, price promotions and vendor managed inventory are all ways to improve inventory availability while minimizing obsolete inventory. Joint forecasting and demand planning, in particular, requires a technology investment. Even today, it can be hard to connect different systems. If forecasts and demand plans are shared via spreadsheet, the likelihood of sustaining this information sharing is low. Joint price promotions ensure that the supply chain has built up inventory to meet increased customer demand. Vendor managed inventory may be one of the easiest ways to share demand information. If a customer is managing inventory at your facility you don't have to share demand, they will see it as it is happening.

The subject of when to collaborate is critical. It should only be done with customers or suppliers who are a large and concentrated part of your business. Otherwise the cost of collaboration can be greater than the benefit. If you don't have a 80/20 relationship in revenue with customers or spend with suppliers then collaboration is probably not the best strategy. Note, that for some companies they seek to not have an 80/20 relationship with customers or suppliers. This prevents any one customer or supplier from having too much leverage over their business. This type of company has made a decision to be somewhat independent of their supply chain.

Another criterion for collaboration is technology. Whether you are considering joint forecasting or product development, you must have integrated information-technology systems to effectively share information. The final criterion is trust. If your supply chain partners have proven untrustworthy or belong to competitors' supply



chains then sharing sensitive information like demand or product development plans can be too risky.

IT in SCM

- Information technologies that enable Supply Chain Management
 - Enterprise Resource Planning (ERP)
 - Cloud computing
 - Application Programming Interfaces (API)

(You can find a full description of “Using Information Technology to Revolutionize your Supply Chain” on www.supplyvelocity.com’s white paper page.)

As stated in the prior section many researchers and practitioners would state that supply chain management only exists because of advances in information technology. Specifically, we can trace the rise of supply chain management to ERP implementation in the early 1990’s. Looking back at Figure 2 we see that the ability to manage materials and financial resources in a supply chain is really about information. ERP systems are a start because they enable your firm to seamlessly share information. Cloud computing makes data available to employees and supply chain partners easier (than technologies such as virtual private networks or VPNs). In the cloud, data resides on servers through providers such as Amazon, Google, Microsoft and many others. Therefore, access (with appropriate security measures) requires only connecting to the internet. Finally there are APIs, which can be considered the evolution of EDI (electronic data interchange). These software tools allow different systems to talk to each other, allowing computers to share information, so people don’t have to.

The takeaway from this section is that without the right technology support it is hard to truly practice supply chain management.



The Bullwhip Effect

- Customer demand variation increases as it moves backwards (to suppliers) in the supply chain

(You can find a full description of The Bullwhip Effect on www.supplyvelocity.com's white paper page.)

As I work with supply chain professionals around the world I always know who has a strong technical understanding of supply chain management, they know about the Bullwhip Effect. Discovered by a combination of P&G and a researcher from Stanford University, the Bullwhip Effect describes how demand variation amplifies as you move from the consumer back through the supply chain (distributors, assemblers, component suppliers and finally raw material suppliers).

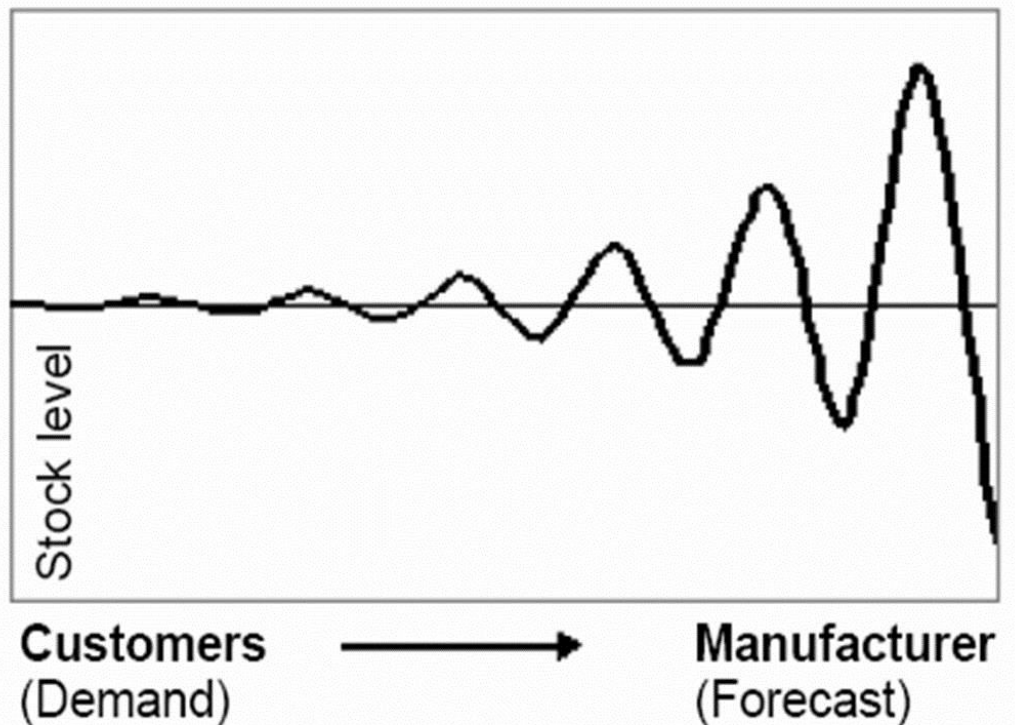


Figure 3: The Bullwhip Effect



The supply chain community is so concerned about the Bullwhip Effect because of the problems it causes in on-time delivery, inventory shortages and over-stocking and the need to have extra capacity or work unnecessary overtime. The Bullwhip Effect is a financial productivity killer. If this variation is not reduced it creates over-investment in the supply chain that could be used to expand services, products and the use of automation and technology.

There are four primary causes for the Bullwhip Effect. These causes can be overcome. I will put some counter-measures directly below the cause.

- Over-forecasting during upward trends and under-forecasting during downward trends
 - Let computers do most inventory reordering
- Economies of scale in transportation require ordering more than what was sold.
 - Utilize third-party logistics providers to fill up trucks with smaller and more frequent deliveries.
- Over-ordering during times of limited supply (vendor allocations).
 - No easy solution as individual companies will always want to over-order to get what they need.
- Price promotions creating un-natural demand spikes (and valleys)
 - Wal-mart has made the most difference with their use of every day low pricing
 - If price promotions will be used, planning them with supply chain partners will allow for slow inventory build-up in anticipation of higher demand.



Aligning the Supply Chain

- Supply chain performance measures
- Vendor managed inventory
- Buy-back agreements
- Coordinated price promotions

All the prior sections lead up to the topic of alignment. This is what we are trying to make happen in supply chain management... allow different firms to work together to increase the supply chain's profit and improve the service provided to the end customer. However, this is the hardest to achieve. Firms can align on planning functions, but to create true alignment supply chain profitability must also be considered. Many researchers have suggested boundary-spanning supply chain performance measures. However, to date (with the exception of cross-ownership) we cannot find examples of firms that subjugate their profitability to other supply chain partners, by choice.

Despite this problem there are examples of firms aligning on financial measures. As mentioned above in the Trust & Collaboration section firms can invite their vendors into their facilities to manage inventory, or even run certain operations. The IT outsourcing community has taught us a lot about aligning with vendors. Manufacturers and distributors / retailers can coordinate on price promotions so that the supply chain wins and everyone accepts lower margins to gain a temporary higher share of demand (and hopefully improved cash flow). Another alignment tool are buy-back agreements. In these agreements manufacturers and retailers would set a price for unsold inventory. The supply chain benefits because retailers would be less likely to stock-out if they knew that they could sell back un-sold inventory. Of course, it could backfire for the manufacturer when they get back un-sold inventory.



The Hierarchy of Strategic, Tactical and Operational Supply Chain Decisions

- Strategic Decisions
 - Greater than 5 year impact
 - Customer service goals
 - Facility location
 - Information technology platform
- Tactical Decisions
 - 1 – 5 year impact
 - Vendor selection
 - Product design
 - Transportation modes
- Operational Decisions
 - Daily, weekly, monthly impact
 - Scheduling
 - Inventory replenishment
 - Carrier choices

I will not discuss the bullet points above, other than to emphasize that as you make supply chain decisions you realize that strategic decisions affect tactical decisions which affect operational decisions. Determining what type of customer service you want to provide will inform every other decision. Once you build a new factory or distribution center it will likely be used for many years and will impact what vendors you use, what transportation modes you use (ship, rail, truck) and even product design (postponement). These same decisions will impact scheduling production and people, how often you replenish inventory and what carriers you use to transport goods. Therefore, don't expect great operational performance if you haven't located your facilities optimally, chose the right technology platform or selected vendors whom you can trust.