**Operations and Supply Chain Management**

**Chapter 1 What is Supply Chain and Operations Management?**

People need to be flexible, play nice, and get creative for a company to function even on a basic level. What kind of collaboration is necessary to make supply chains link together? Why do supply chains matter and how do everyday decisions in supply chains have magnifying effects?

Supply chains ultimately give us access to everyday products and services. As your preferences evolve, supply chains are there to make your wildest demands seemingly realistic, or even possible! A key insight to understand is how disruptions in supply chains impact the business world and our lives.[[1]](#endnote-1)

As marketplaces evolve, processes, procedures, and strategies within an organization must adapt to meet both a company’s internal strategy and market demand. Many of the adaptations that are required to help businesses stay competitive fall under Supply Chain and Operations functions. By working with other organizational departments, the supply chain is strategically positioned to efficiently and effectively deliver value, while optimizing the firm’s resources.

Market changes consist of shifting trends in regulations, consumer demands, demographics, macroeconomics, etc. Inefficiently navigating such changes can have catastrophic financial and reputational impact. Conversely, how an organization adapts its Supply Chain Operations (SCO) to external factors outside its control, can serve as a means for significant and sustainable business success.[[2]](#endnote-2)

SCO can enhance business performance in many ways: [[3]](#endnote-3)

* **Competitive Advantage** – allows companies to operate in a more favorable way that competitors are not able to match and creates a more favorable position for firms, resulting in greater profitability.
  + Geographic CA - are you able to offer products in areas that your competitors can’t reach?
  + Manufacturing CA - can you make the same product faster than competitors?
* **Customer Satisfaction** – customers can have high expectations of the products and services that they use. [[4]](#endnote-4) Expectations form around delivery of product and service at a given price, location, and time.
  + There are costs associated with how you provide products and services at different expectation levels.
  + Without effective SCO, hiccups such as inventory shortages or delayed service requests can decrease customer satisfaction and even lose customers to competitors.
* **Efficiency** – SCO, in most instances, has the greatest impact on organizational efficiency, driven by its focus on the bottom line and achieving more with less.
  + Walmart exemplifies SCO efficiency – by harnessing new technologies Walmart has improved the flow of information throughout the company and reduced inefficient and excess inventory levels.
* **Cost Cutting** – is the most often recognized SCO benefits and is closely tied to efficiency through its impact on cost decisions, such as input cost reduction, production cost minimization, and expensive product features elimination. Product and service quality should be a critical constraint in all of these SCO considerations.

Each of these benefits requires interdepartmental cooperation and collaboration to achieve synergies and deliver on the company’s strategy.[[5]](#endnote-5) Supply Chain and Operations usually falls under the Chief Operating Officer (COO). **Supply Chain** externally focuses planning, sourcing, and distribution efforts while **Operations** internally focuses on how to best control things like manufacturing and quality. Supply Chain and Operations substantially overlap and depend on one another and therefore we can use the term **SCO** to represent both.

High level directives for a business are used to meet customer needs, achieve business goals, and remain competitive through differentiation.[[6]](#endnote-6) With a strategy in place, responses like new product development and geographic expansion can be used to achieve desired financial and growth targets. In addition to business strategy, sub-strategies may also exist for specific areas of the value chain involving marketing, research, and innovation.

**Planning -** with a supply chain strategy in place, companies must forecast their performance. A primary goal at this stage is to predict how many units of a product or service will be sold or delivered.[[7]](#endnote-7) This unit forecast flows through to determining raw material, production time (lead-time), capacity, and storage requirements.

**Sourcing -** companies must “source” materials and assets needed to produce goods and services including purchase of raw materials that will be inputs for manufacturing, managing human capital required for assembling products, collaborating with media firms that assist in producing digital content, etc. Sourcing involves selecting which resources to obtain, how much to pay for those resources, coordinating the timing of resource delivery, and partnering with resource suppliers. Cultivating strategic relationships is thus critical in order to ensure consistent and reliable inputs into the supply chain.[[8]](#endnote-8)

**Manufacturing - i**nputs gathered at the sourcing stage are then utilized during manufacturing processes for products and their associated attributes. Various manufacturing methods can be used to shorten lead-times, hold less inventory, or produce less waste. These parameters serve as constraints on manufacturing design.[[9]](#endnote-9)

**Quality -** is usually the last line of defense before a company ships its product to market. Quality management systems are often utilized to ensure that products meet safety requirements, desired customer criteria, and consistency. Regulatory requirements and compliance with international product standards can also play a role.[[10]](#endnote-10)

**Distribution -** after quality is verified, products can be sent to consumers by different means such as truck, plane, rail, mail, etc. Distribution also involves management of timing and geography and is a function of a company’s business model, pockets of consumer demand, seasonality, shelf-life, and countless other factors.[[11]](#endnote-11)

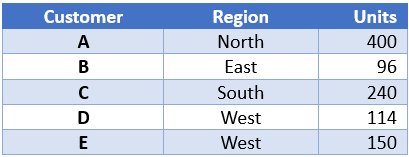
**End Consumer -** rarely will end consumers realize the level of planning, organizing, and diligence required to deliver even the most basic products. Driven from a strategic perspective, a product will have built-in attributes designed to meet customers’ needs and thus warrant an incentive to purchase.[[12]](#endnote-12)

When customers’ needs are not met and a product is not being purchased, oftentimes companies pivot their supply chains. This often circles back to the strategic decisions that drove the justification for producing the product in the first place. Problem-solving is a vital element in making supply chains sustainable and functional for day-to-day operations.[[13]](#endnote-13)

**CTC Scissors Co[[14]](#endnote-14)**

**Background** CTC, a leader in scissors for offices and households, has been in business for over 50 years with a strong customer base and financial performance and currently employs 80 people. Sales span four regions – North, East, South, and West – with three major competitors in all regions combined. The company is responsible for each step within the supply chain including materials procurement and manufacturing at their factory.

**Product** CTC produces only one scissors which is comprised of two stainless steel blades with handles and a pivot pin. Producing only one product is unusual given general production overhead costs, however the single scissors is enough to justify operations in CTC’s case.

**Customers** CTC has five customers that cumulatively purchase 1,000 units as described in the table on the right.

**Trends** Over the past three years, CTC has experienced declining sales and is considering whether to add to and/or make changes to their core product in order to better align with customer preferences and market trends.

**Strategy** CTC must therefore examine the implications of changing their product mix and how different functions within the supply chain could respond. The aim will not be to advise on what is the correct course of action, but rather to highlight the trade-offs that SCO managers must analyze in order to move the organization forward. Although Sales, Marketing, and Product Development are not our key focus areas, we must consider how these departmental priorities and decisions impact SCO within CTC.

From an end-to-end perspective, we can view all of these considerations in three categories:

* Consumer Voice – gives companies indications regarding consumer preferences, priorities, and expectations.
* Meaningful Insights – examined in detail by sales managers and marketing teams.
* Organizational Response – coordinated efforts by human resources, information technology, and SCO.

**Sales and Marketing Impact**

Sales and Marketing serves as an integral part of the feedback loop, alerting the rest of the company about changing consumer needs and new trends in the market by both existing competitors and new entrants[[15]](#endnote-15). This often presents challenges to SCO due to the lack of understanding of what constitutes practically feasible and financially viable changes that can be made to keep up with evolving market conditions. Key Sales functions include:

* Developing relationships with clients.
* Gaining knowledge about local markets.
* Defining the differentiating factors of the company.
* Offering customized solutions to meet customers’ needs.
* Providing critical insights into the reasons for observed sales trends.
* Relaying information so it can be communicated within a broader organizational context. This feedback can be analyzed to support a proper response. Marketing managers can contribute meaningful insights into how to respond to such news and developments.

Marketing managers’ response is based on organizational size, goals, and structure. Marketing, through Segmentation Analysis, also assesses key market segments to understand how to grow the business and what changes will be needed to make this happen. The 4P’s of Marketing – Product, Price, Promotion, and Place – is a commonly used framework to evaluate if the right product or marketing mix exists to satisfy the company’s customer segments.[[16]](#endnote-16)

**Product** is the company offering the correct product and/or service to meets consumers’ demand, specifically in terms of benefits and features?

**Price** is the amount of money customers are willing to pay and is based on how much they value the product and its attributes. Price is also a function of distribution, production costs, and competing prices.

**Promotion** is primarily a Marketing function that involves communicating with customers through advertising, sales tactics, special offers, and store promotions/incentives. The cost associated with these promotions is most commonly subsidized by the company and not the retailer that is selling to the end consumers.

**Place** deals with how the product is distributed to end customers – big box retailer or specialty store, online or brick-and-mortar, etc. Place is tied to the nature of the product – perishable items may be more difficult to purchase online, or a large printer may not be available for pick-up, etc. Product, price, and promotion will all dictate where the product can be sold.

Another perspective that is required comes from Research & Development and this perspective combined with Sales and Marketing will help in assessing the appropriate action for CTC and what the implications will be for the supply chain.

**Product Development Impact**

Product Development divisions often pair engineers, scientists, project managers, and academics together to explore new product or service opportunities. PD works closely with SCO to understand current capabilities, areas for improvement, and aspirational goals and may design an Innovation Strategy to parallel a Marketing Strategy.

Most PD companies apply Stage Gate, a process designed to understand the viability of a new product or enhance existing ones. Each set of activities in this process must be validated before it can pass through the “Gate” to the next stage and can be generalized by the follow set of activities:[[17]](#endnote-17)

**Gate 1** Idea generation; Idea screening (Validation)

**Gate 2** Concept testing and development; Market strategy; Business analysis

**Gate 3** Feasibility testing; Product development; Market testing

**Gate 4** Commercialization

SCO managers are the voice at the table that communicate how product development decisions may impact planning, sourcing, manufacturing, and distribution. Oftentimes, the biggest question to answer is if it’s time to innovate, and if so, how will it be done, when, and by whom. With an understanding of how Sales, Marketing, and Product Development impact new and existing products, we can now circle back to the feedback received from the field by Sales. We can critically evaluate each product request to understand how CTC can respond. Note that each decision may impact the other, and the firm will need to evaluate each collectively in order to decide a course of action.

**Decision Making in the Context of Information**

**Customer A** **Sales** - makes of 40% of CTC sales and claims that they are willing to switch to a competitor who is offering a required grip on the scissors that CTC currently doesn’t offer. ***A*** is also willing to pay 25% more than what they currently pay CTC for the competitor’s scissors. How serious is ***A*** about their willingness to switch suppliers? We don’t know for sure. Could they be pressuring CTC to change its product mix? Remember that with a relationship and distribution in place, ***A*** might just find it easier to stick with CTC.

**Marketing** – will scissors with a grip be a consistent and sustainable product demanded into the future by ***A*** and also by other customers? Can it be distributed by the same means and channels? Can CTC manufacturer it at a competitive price – recall that A is willing to pay 25% more for the competitor’s scissors.

**Product Development** – CTC has not innovated since its founding so introducing a new product presents challenges and the learning curve becomes a factor. CTC has mastered production of its current scissors, so this leaves room and time for R&D and PD to focus on the practical issues of introducing a new product.[[18]](#endnote-18) Quick prototyping of the new scissors has shown that the new product could easily be made with modifications to the manufacturing process and purchase of additional raw materials.

**Decision** – CTC will go forward with manufacturing a second scissors with handle grips.

**Customer E** There can be many reasons for the decreased demand from 150 units to 50 units by ***E*** (at 150 units this represents 15% of CTC unit sales). Reasons include decrease in market size in ***E’s*** region, new competitors of ***E*** entering the region, and/or many other factors. If the reason(s) are understood, CTC could respond by adjusting its sales, promotions, distribution strategies, etc. At a cross-functional level, however, there is not much from the SCO perspective that CTC can do.

**Decision** – Research reasons for decreased demand but no immediate involvement by SCO.

**Prospect** **Sales** – Connie’s is a big-box retailer, that operates in all four regions, and is interested in purchasing 400 units of CTC’s current scissors but at a 5% discount – keep in mind that the high volume may compensate for this discount. Connie’s is also interested in scissors with decorative blades used in a much smaller crafts market. With ***E’s*** order cut, picking up Connie’s business will help to maintain or even grow its business. Although the decorative scissors are not required for gaining their business, it would help towards accessing customers in new segments and reducing the number of suppliers on whom Connie’s relies.[[19]](#endnote-19)

**Marketing** – if there is a way to reduce manufacturing costs to offset the price discount **without** sacrificing product attributes and quality, it would be a potential avenue for gaining market share that CTC may not reach through its current distribution network. In terms decorative scissors, this product variation appeals to a much smaller niche market that CTC does not currently understand well. Without this understanding, it does not make business sense to devote and/or divert resources towards this variant especially given that the target market segment does not align with the overall company or marketing strategy.

**Product Development** – initial feasibility testing suggests that decorative scissors would require substantial product modifications. Also given the size of Connie’s traditional scissors order and the addition of the new grip handle scissors, CTC may not have manufacturing capacity to produce a third variant. It may be too much innovation to manage all at once. Although certainly not impossible, given the time required to bring decorative scissors to market may make adding the variant too much to handle at this time.

**Decision** – CTC will not pursue adding decorative scissors to its product mix. However, CTC will continue researching ways to cut manufacturing costs to compensate for Connie’s pricing discount.

**In summary –** what are the implications of these decisions on the SCO function?

1. Cite three recent examples of supply chain disruptions in the SCI and their downstream consequences. [↑](#endnote-ref-1)
2. Describe three situations where SCs navigated trends using SCO adaptations to their benefit. Describe three situations where SCO adaptations, or the lack thereof, had detrimental impact. [↑](#endnote-ref-2)
3. Describe a company that succeeded and one that failed in context of one or more of the four benefits of SCO. [↑](#endnote-ref-3)
4. What factors impact customer expectations? [↑](#endnote-ref-4)
5. Is there a correlation between size of a company and its effectiveness in interdepartmental collaboration? Is there a way to gauge how good a company is with regards to driving interdepartmental collaboration? [↑](#endnote-ref-5)
6. Discuss how three different SCs assess customer needs, business goals, competition, and product differentiation. [↑](#endnote-ref-6)
7. Describe three specific planning scenarios in the SCI. What methods do SCs use to predict and plan unit demand? [↑](#endnote-ref-7)
8. Discuss the sourcing for each stage in semiconductor BE-M and FE-M. [↑](#endnote-ref-8)
9. Describe how SCs monitor and try to improve manufacturing parameters in BE-M and FE-M. [↑](#endnote-ref-9)
10. What kinds of quality management systems do SCs use and how do these systems impact customer expectations, customer fulfilment, and the SCs own profitability? [↑](#endnote-ref-10)
11. Describe the nature of SCI distribution networks across all stages of the SCVC. [↑](#endnote-ref-11)
12. How do SCs optimize SCO given the many end-customers that exist between SCVC layers? [↑](#endnote-ref-12)
13. Discuss three instances where SCs and the SCI as a whole had to pivot their SCO. What are the challenges involved in performing these pivots given the complexity of their SCO? [↑](#endnote-ref-13)
14. For every SC, create a matrix that outlines the SC’s background, product mix (sorted in some meaningful way), customers, consumer trends (consumer voice), how current product mix matches current customers and some assessment of evolution and matching of product / consumer trends (meaningful insights), response function of different company divisions (focusing on SCO) to keep up with or close gaps between product and consumer (organizational response). [↑](#endnote-ref-14)
15. Can you quantify how performance correlates to the quality and acuity of Sales and Marketing? [↑](#endnote-ref-15)
16. Layer in the 4Ps into the matrix discussed in endnote 14. [↑](#endnote-ref-16)
17. Discuss how “Stage Gate” is applied by three different SCs. [↑](#endnote-ref-17)
18. How is R&D and Product Development structured and configured with regards to business and product trends? [↑](#endnote-ref-18)
19. Cite examples of how SCs manage feature selection in context to consumer and competitor trends. How does manufacturing capacity impact feature selection? [↑](#endnote-ref-19)