Strategic Supply Chain Management for Distribution

Distributor Perspective

Fluid Dynamics, Inc., is a publicly held fluid power distributor headquartered in Los Angeles. Annual sales are $350 million. Profitability and stock price have declined for the past two years. Fluid Dynamics has twenty branches located on the West Coast and in the Midwest. Its major customers are large manufacturers that use fluid power components in the maintenance and repair of their facilities. Major suppliers include Vickers, Eaton Corporation, Gates Manufacturing, Sauer-Sundstrand, and SMC Pneumatics. In an attempt to increase sales and improve profitability, top management of Fluid Dynamics used an independent third party to conduct a customer satisfaction survey. Results of the survey indicated that (1) it is difficult for customers to do business with Fluid Dynamics, and (2) it is also difficult for Fluid Dynamics to do business with its suppliers. The difficulties described by both customers and suppliers include: excessive time required to develop quotations, inadequate information regarding available inventory, failure to ship products on time, and the inability to forecast properly. After obtaining the results of the survey, Fluid Dynamics formed an internal team consisting of individuals from sales, operations, purchasing, and engineering to develop a plan of action to resolve the problems identified by the survey. David Miller, director of operations for Fluid Dynamics, has been assigned the role of team leader.
Introduction

The supply chain consists of all contributors to a final product and its delivery to the consumer or end user. A sample supply chain would consist of a mining firm that extracts iron ore from the ground, a logistics carrier that delivers the iron ore to the steel mill, the steel mill that refines the ore, the logistics carrier that delivers bulk steel to a steel service center (a form of distributor), a logistics carrier that delivers smaller bundles of steel from the distributor to a manufacturer of drilling equipment, a logistics firm that delivers the drilling equipment to an equipment distributor, and the distributor who sells or rents the drill to a mining firm. This supply chain is circular, but typically supply chains are presented as linear in nature (see Figure 2.1).

The circular supply chain described above is not the only exception to the simplistic linear view of supply chains. Most supply chains, linear or not, are more complex than the theoretical model depicted in Figure 2.1. In addition to the circular supply chain’s supplier, who is also a customer of the supply chain, there are other players who do not fit neatly into the picture. The steel mill, for example, has other suppliers that are competitors of the mining firm. It is a stretch for the mining company to consider the steel mill a partner in the supply chain, when the mill does business with its would-be “destroyers” (other mining firms), with obvious strategic implications.

The relationship problems between the steel service center and the mill are the same as those between the service center and the end user. The supply chain is not, in fact, linear. Each member acts as a nexus of crisscrossing supply chains. The supply chain planner must also consider service providers (insurance and accounting firms, for instance) and providers of ancillary products (maintenance, repair, and operations, commonly called MRO, products). While not recognized directly in the theoretical linear supply chain, they contribute to its success or failure tremendously.

Given that the supply chain is a complex, nonlinear environment, the cooperation concept that lies at the heart of Supply Chain Management (SCM) is challenging, at best. If the members of the supply chain can overcome the difficulties it poses, however, there is much to be gained. The goals and rewards of SCM are numerous, but they require the application of managerial strategy, new processes and procedures, and technology. Until recently, technology was not able to contribute as much as
was needed to the SCM movement. In many ways, SCM was hampered by the lack of enabling technologies. E-business has stepped into this void. This chapter looks at the foundations of SCM, and at how e-business tools will be used by distributors to enable and enhance the new channel relationships.

The Evolution of Supply Chain Management

SCM goals are based on classic theory that until recently was either difficult to put into practice or poorly understood. Most firms focused on their own operations and found that challenge more than sufficient. In addition, the business world did not define success along supply chains but on a firm-by-firm basis. A company could seek more profit by outperforming its competition or by outmaneuvering its suppliers and customers. The result was the same, so American firms focused on adversarial (bidding war) relationships with suppliers, and advanced sales and marketing efforts with customers. In this type of environment, cooperation between supply chain members is lost, since no one really recognizes the supply chain as a competitive unit.

Early attempts at SCM came mostly through vertical integration. Henry Ford attempted to bring a complete supply chain together, from raw materials all the way through to the final purchase by the consumer. Such applications were rare, however, and outside of a few industries (oil companies are an excellent example) proved difficult to maintain. Manufacturers have different core competencies from distributors and logistics providers. The vertical integration movement lost momentum, as specialization proved more powerful than integration.

Integration was far from dead, however, and would be revived halfway around the world. Scientific methods were being applied to business processes, and the value of integration was obvious. New techniques were being developed for purchasing procedures and manufacturing process control like Economic Order Quantity (EOQ) and Statistical Process Control (SPC), and while marketing- and material price-driven firms in the U.S. would be slow to adopt these techniques, they would find a home in Japan.

Japan emerged from World War II with its economy shattered. Industry did what it could to pick up potential markets, and a great deal of interest surrounded any method that could make Japan competitive with the rest of the world. Two major schools of thought, one new and one more well developed, came together in this environment. The first was led by Japanese thinkers like Toyoda, Ohno, and Shingo and became known as Just in Time (JIT) when it hit the U.S. The second was led by American theorists like Deming, Juran, and Crosby and became Total Quality Management (TQM). These two movements would reshape the business world.

The U.S. was slow to take notice. Japanese firms quickly adopted TQM, since it eliminated waste (scrap), and JIT, since it saved space and financial resources (inventory reduction). In a country where space was at a premium and resources were dear
after the war, the programs made a lot of sense. In the U.S., American manufacturers were finding that they could sell stuff as fast as they could make it. TQM and JIT did not appear to lead to increased capacity; in fact, JIT seemed to pose the risk of losing capacity, since inventory was typically used as a buffer against forecast error and manufacturing or logistics systems failures. Most U.S. firms focused on making what they could make the most money from, and the American marketing machine sold whatever the manufacturers could produce.

The world changed in the 1970s, however. The relative abundance of U.S. resources came to an abrupt halt with the Arab oil embargo of 1973 and the subsequent shocks associated with OPEC policy and the overthrow of the Shah of Iran. Suddenly, at least one resource (fuel) was not limitless, and the cost of operating manufacturing plants increased significantly. Reducing manufacturing waste should have taken center stage, but the oil embargo touched off an inflationary period that would mask the problem for nearly ten more years.

The inflation of the 1970s actually made it profitable to hold inventory. If the margin on a product was 30% and inflation was 10%, then a firm increased its margin as it held the product, at a rate of 33% the first year. Distribution was a good field to be in, since distributors by nature held inventory and it was appreciating at such high rates. The process encouraged large inventories and covered up a lot of sins. Low inflation in Japan, however, prevented the same phenomenon, and so the research on TQM and JIT continued. In particular, Japan was making great strides in the area of setup reduction.

Setup reduction focused on reducing the amount of time and expense it took to initiate an action like changing over a machine or issuing a purchase order. The most dramatic success was the work of Shigeo Shingo and others on reducing machine change over time.° The reduction in purchase or transaction costs was not emphasized to the same degree. Since distribution is a transaction-driven business, transaction cost reduction would have hit home sooner. Distribution was not emphasized in the Japanese research efforts, however, so American distributors were given a reprieve. American manufacturers, however, were in for a considerable shock.

The 1980s brought a new era for manufacturing. Inflation was reined in during the early eighties, so inventory profits went away; suddenly holding inventory cost money. In addition, the first time since World War II, American manufacturers had competition to face, and it was formidable. Europe and Japan had recovered from the war, and there was now more capacity than demand. U.S. firms could no longer sell merchandise as fast as they could make it. What was worse, the competition had lower cost structures and better-quality merchandise. American firms fought back gamely, using marketing techniques, but the battle was a losing one. For the first time, American manufacturers took a serious look at JIT and TQM. It was not to be an easy transition, however.

As the manufacturing community suffered losses and worked through the TQM and JIT learning curves, distributors remained largely unaffected. Manufacturers were rushing to get out of the inventory business, and though inventory profits from inflation were gone, demand for distribution services (especially local inventory)
soared. There was a cloud on the horizon, however: as the demand for local inventory and JIT delivery increased, margins started to narrow. Manufacturers also started to pressure distributors to adopt TQM and, in particular, ISO 9000 standards to fit in with their own quality strategies.

ISO 9000 standards were a European-initiated effort to bring quality-control measurement under a single umbrella. It was quite successful and went a long way toward introducing the distribution community to TQM. JIT was slower to mature. TQM was, in fact, an enabler for JIT, since poor quality led to stockouts (the bane of JIT). Until the TQM movement gained momentum, American manufacturers had great difficulty implementing JIT. Once TQM was well understood and widely adopted, JIT was the next logical step. While TQM and ISO 9000 were comparatively successful in distribution, JIT would prove to be one of the biggest challenges in distribution history.

Manufacturers typically handled JIT using a three-pronged approach. First, setup reduction and TQM were applied internally to production lines to eliminate the need for work in process (WIP) inventory. WIP is typically the largest inventory in a plant. Next, suppliers were asked to deliver directly to the manufacturing line Just in Time for processing. This forced suppliers to carry more inventory to avoid shutting down the manufacturing lines. The need for ready access to inventory increased the supply chain’s dependence on distributors, and the increase in supplier inventories caused many to claim that JIT merely pushed inventory upstream.

The third point of attack was less controllable. Manufacturers tried as much as possible to “fix” production schedules to limit forecast error. This meant that customer demand could not be met in some cases, and those most likely to get left out were small customers. Those customers would have to either carry more inventory or rely on distributors. Distribution inventories had to expand again. Inventory was being pushed downstream as well as upstream, and most of it was going into distributor warehouses. Manufacturers showed tremendous success at reducing their own inventories, but the supply chain saw only marginal gains.

There was an obvious need to rethink the supply chain. SCM came about as a response to the failure of JIT to fully benefit the end user. Essentially, SCM is JIT on a global basis. The causes of distribution inventories were principally information based: poor forecast information and short response times under JIT were forcing distributors to carry large inventories. SCM would force distributors to look at how they applied forecasting and exchanged information with their customers and suppliers, and how they tracked and measured system performance. Information management would be the key to SCM. While SCM theory was being developed, the Internet and e-business were also being developed. The latter two would come together to change the way the supply chain looked at distribution.

Supply Chain Management Goals

Understanding the SCM goals requires starting with the end user and working backwards through the supply chain. The end user wants useful products, at the right time and place, at the lowest possible cost. These requirements have not changed
much from the beginnings of commerce. SCM takes these goals and translates them to actionable objectives that are tracked throughout the supply chain, rather than having each member act as an island.

The first goal, useful products, requires that the entire supply chain understand the end user’s needs. Distributors offer flexibility to the end user by aggregating many products across many manufacturers into one-stop shopping. The greater the flexibility, the greater the inventory cost as more products are added to the distributor’s offering. If the supply chain has a poor understanding of the end user’s needs, then either more products will be needed in the distributor’s catalog or the end user will be forced to operate with less than optimal support. Each alternative is a loss for the supply chain, and each is information dependent. The end user’s needs, both current and future, must be captured and passed up the supply chain to manufacturers and their suppliers. Part of the problem is effective capture of buying patterns and unsatisfied requests. The other issue involves extrapolating probable future needs from the end user’s environment before they occur.

The second goal is to meet the end user’s needs at the right time and place. This is a capacity-management issue. If sufficient capacity is made available and the appropriate lead time is provided, the supply chain can meet the end user’s time window. Capacity comes in two forms: production and stored. Production capacity requires availability and a sufficient time window to produce and deliver. Stored capacity is inventory that is used to protect the firm from stockouts. Stored capacity can only be reduced if the causes of stockouts are reduced. Both are forecast dependent. If the forecast is 100% accurate for the time period in question and capacity is available, then the end user’s order can be met. If the forecast is inaccurate and planned capacity is not available, then excess capacity will be needed to meet the end user’s request. Excess capacity can be idle machinery, but more than likely it will be inventory (stored capacity). Excess capacity, either inventory or equipment, is expensive and increases cascading costs in the supply chain that ultimately affects the end user’s cost. Forecasting and capacity planning are information based.

The process of getting useful products to the right place at the right time can run counter to the final objective: the lowest possible cost. TQM, however, has demonstrated that quality costs far less than many once thought and in many cases pays for itself. The same may be true for distribution processes. A better forecast will reduce system costs through reduced need for inventory and reduced stockouts for the end user. Better forecasting allows for better capacity planning, which translates into better availability and less idle capacity, production or stored. SCM proposes better supply chain planning by starting with the end user’s needs and setting up forecasting and capacity planning methodologies that target the end user instead of simply meeting the needs of the firm in question.

**New Expectations for Distributors**

What does all this mean for distributors? Put simply, distributors will have to manage their customers needs, transfer significant information up the supply chain in a timely fashion, and cooperate with other supply chain members in using that information to
reduce cost for the end user. The distributor’s role has not changed; these expectations have always existed. What has changed is the volume and speed of transfer of the information side of the distributor’s business.

SCM seeks to decrease costs and increase customer service simultaneously. The only way to do so is to greatly improve information-related activities in the supply chain. Distributors will be asked to increase their information gathering, handling, and analysis.

The information-gathering expectation means that distributors will be expected to obtain greater information volume and/or quality from the end user. The ability to do so will vary from channel to channel, but, as this book will demonstrate, every channel will have both the need and the opportunity to improve end user data. Greater volume can take many forms, from increased use of customer feedback mechanisms like surveys to sales force automation, where information that formerly only resided in a salesperson’s head is transferred to the distributor’s information system.

Better quality means that sources of inaccuracy are reduced or eliminated, the first and most obvious being lack of timeliness. The older information is, the less reliable it is. Information automation will offer many opportunities to transfer data more quickly through the supply chain. Quality also applies to the types of information generated. Forecasts, for instance, can be greatly enhanced by the use of direct customer and salesperson input under controlled circumstances. Information that was formerly unavailable for sharing with suppliers will become available through new technologies as the e-business movement proceeds.

Information handling refers to the stress distributor systems will undergo as this veritable mountain of information is dumped into them. Many distributors have already discovered that e-business overwhelms their legacy or ERP (Enterprise Resource Planning) system. A legacy planning system is an outdated computer system passed on to IT personnel and managers, who apply it to planning problems that have changed, using awkward data linkages to newer systems. An ERP system allows a company to replace inefficient legacy systems and to homogenize and integrate disparate corporate databases. Collecting information is one thing—what to do with it when it becomes available is another. This is a technology issue and, therefore, somewhat short term in nature. Even so, skill in handling large volumes of data will be valued for some time to come.

Information analysis skills could become a differentiator for distributors. Suppliers have long counted on distributors to open up new markets, maximize opportunities with existing customers, and ensure that supply meets demand. From forecasting to marketing studies to new product development ideas, there are many opportunities for analysis that improves the efficiency of the supply chain. Other supply chain members will conduct their own analysis, but the distributor’s unique position in relation to the end user will make distributor information different from that available to other supply chain members and should add considerable value.

The new expectations will, therefore, revolve around the distributor as information manager in either marketing or logistics. The distributors will continue in their
role of marketer for manufacturers and logistician for end users, but that role will become information intensive and customer/supplier expectations will drive distributors toward better gathering, handling, and analysis of that information.

Customer Alliances

E-business is, in many ways, an outgrowth of Supply Chain Management. The SCM movement already existed, but few believed it would advance quickly, since information management needs were so high. E-business was quickly recognized as an enabler for SCM and was even seen as a substitute for distribution. As was explained in Chapter 1, this expectation was an oversimplification of distribution processes, but the belief that e-business would transform distribution was grounded in fact. The advent of e-business tools has thrown many SCM programs into hyperdrive.

Perhaps the most prevalent feature of SCM is customer and supplier alliances. Customer alliances have long existed in programs like Vendor Managed Inventory (VMI) and Integrated Supply (I/S). SCM rolls these programs under its umbrella. Alliances are key to information exchange. VMI and I/S, though principally outsourcing arrangements for customers, are major information opportunities for distributors. Any distributor in such an arrangement who does not take advantage of the increased quality of information available is likely to fail.

SCM programs are customer driven. Many customers perceive the exclusivity of such arrangements as a tremendous value to distributors. They have, therefore, negotiated hard over these arrangements, putting pressure on distributor margins. VMI and I/S have higher service requirements, inventory management (if not outright ownership) being foremost, which has put further pressure on distributor margins. If the additional volume and increased information quality cannot be capitalized upon, many distributors will suffer from extreme margin erosion (some already have).

Supplier Alliances

By the end of 2000, the e-business movement had increased supplier power. Alternative channels of distribution sprang up in the form of “dot-coms” at first, then evolved into channels that could be supplier dominated through the use of third-party logistics carriers (3PLs) in conjunction with e-business tools. These channels have failed to materialize in all industrial sectors. However, the possibility exists for supplier-dominated channels to materialize in most supply chains.

This change in dynamics increased supplier power. The traditional business models had, in effect, become unfrozen. Most members of the channel recognized this
fact and began scrambling to gain an advantage. This traditional “island” approach of adversarial relationships within the supply chain led to considerable breakdowns in channels. Many manufacturers sought to change the channel dynamics before the models “refroze.”

One of the major objectives was a closer relationship with end users. Suppliers felt the distributor owned this relationship and frequently manipulated it to the manufacturer’s disadvantage. The new environment offered the opportunity, and the tools, to change this arrangement. As part of their new distributor alliance, many manufacturers began to demand direct, unfiltered end user information. Manufacturers felt this information would increase their understanding of the market, leading to better planning.

Other channels had already experienced this sort of changed relationship. Channels that had already adopted e-business through the use of EDI had encountered these same issues and had arrived at different ways of dealing with the problem. In retail, the suppliers had been expected to carry out VMI as the customer (retailer) came closer and closer to a “hands off” inventory policy. In electronics distribution, the supplier developed franchise arrangements with distributors, with detailed expectations for information exchange and support for the manufacturer’s products. In the latter arrangement, the manufacturer had become a customer. In the former, the manufacturer shouldered a major burden in the interest of getting closer customer contact.

**Evolving Channels**

The “unfrozen” business models caused great consternation in traditional channels as manufacturers, distributors, 3PLs, and customers jockeyed for position. It seemed likely that models developed in retail and electronics would be introduced in more channels but that other channels would take an entirely different direction. Integrated Supply, for instance, popular in Maintenance, Repair, and Operations (MRO) supply, would have to be handled differently, but there were opportunities for e-business to have a tremendous impact on I/S. How these other channels would be handled and how manufacturer/distributor/3PL/end-user relationships would look was still unclear at the end of 2000.

This positioning had a worrisome backdrop to it as well. Those firms that had jumped into e-business were finding it could be extremely costly and that many issues were outside of just one supply chain member’s control. Teamwork (alliances) with customers and suppliers would be essential to e-business success. The stage was set for the next step, a refreezing of the business models in their new form. Partnerships were going to be a key factor in e-business success. The SCM principles of alliances and cooperation in the supply chain would be the path to e-business. E-business was the enabler to SCM, and vice versa.
**Distributor Retrospective**

David Miller must understand that Fluid Dynamics has to manage the needs of its customers and transfer this information up the supply chain to its suppliers in a timely fashion. Fluid Dynamics has an excellent opportunity to decrease costs and increase simultaneously customer service. Also, Fluid Dynamics has the potential to differentiate itself from other fluid power distributors by developing the appropriate information analysis skills. The key for David Miller’s team is to develop a plan of action and then successfully implement the plan.

**Issues to Consider**

1. To what degree will e-business enable supply chain management?
2. What were the two business movements in the post–World War II U.S. that reshaped the business world?
3. What was the financial environment of the 1970s, and what was its impact on distributors?
4. What have been the three principal elements of the manufacturers’ response to JIT, and what were the likely reasons why their response was unsuccessful?
5. How will supply chain management help to reduce production and stored capacity?
6. What are the challenges, from the distributor’s perspective, that e-business brings to customer and supplier alliances?

**Notes**

8. Ibid.