

# VALUE CHAINS, VALUE NETWORKS AND SUPPLY CHAIN MANAGEMENT

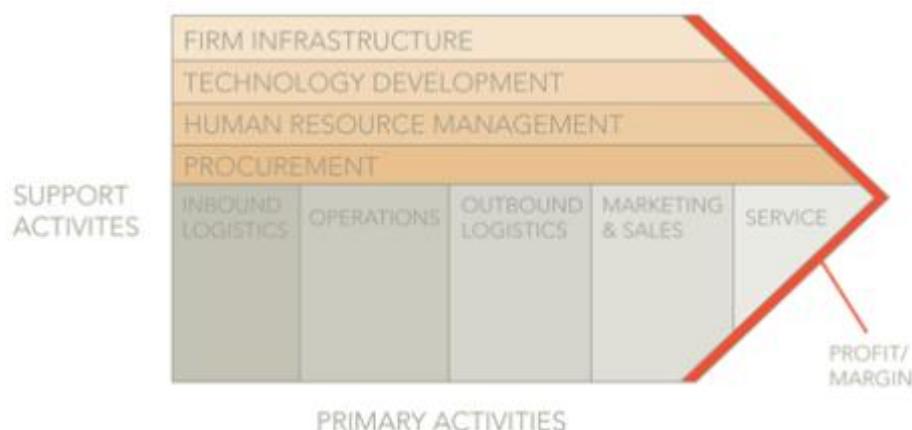
This article considers writer Michael Porter's value chain framework, which has been described as a powerful analysis tool for companies in strategic planning to create value. It also highlights the various definitions of supply chain management put forward by different writers

Sections A4, E2 and E3 of the *Syllabus* and *Study Guide* relate to value chains and value networks, and Sections E2 and E3 of the Paper P3 *Syllabus* and *Study Guide* relate to the supply chain with particular, but not exclusive, reference to the application of e-business.

Value chains and supply chains have featured explicitly in the pilot paper, December 2007, December 2009 and June 2012 exams. In addition, value chains can often be used in position analysis.

## THE VALUE CHAIN AND VALUE NETWORKS

Porter's value chain displays groupings of all the activities that organisations carry out. The activities are divided into primary activities and secondary activities. All activities have costs and successful businesses organise and carry out their activities in such a way that value is added. It is the value added that allows revenues to exceed costs so that profits are made.



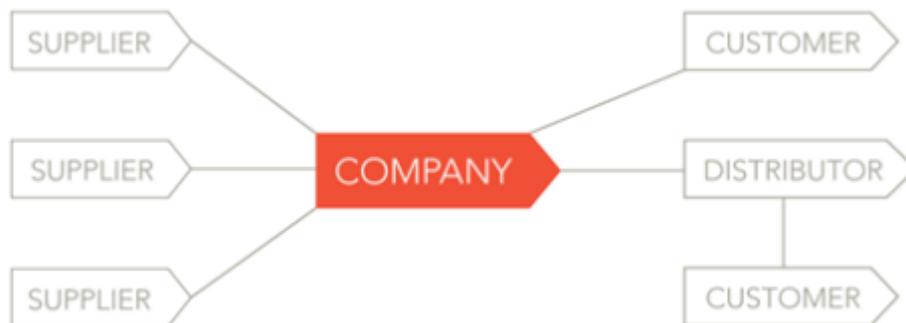
To add value, the organisation must be doing more for its customers than simply carrying out the 'face value' of the activities, otherwise customers would presumably carry out the activities themselves. Customers either cannot carry out the activities at all, or cannot match costs, or don't want to carry on the activities and so are willing to pay others to carry them out instead. For example:

- knowhow – suppliers often use knowhow that customers simply don't have
- economies of scale – suppliers often produce efficiently in huge volumes with each customer buying only a small proportion. Suppliers' economies of scale simply cannot be replicated by each customer

- risk – suppliers might shoulder production risks that customers don't want
- location – suppliers might be in a low-cost area while customers are in a high cost area
- flexibility – suppliers are variable costs, while doing it yourself usually entails more fixed costs.

As always, success in business arises from one of Porter's generic strategies – cost leadership or differentiation – each with or without focus. Value chains have to underpin the chosen generic strategy. So, if cost leadership is the strategy, the value chain adds value by enabling low cost production.

Curiously, the value chain relegates procurement (the purchase of goods and non-current assets) to a support activity, yet has sales and marketing in primary activities. In modern manufacturing companies this disparity does not make a lot of sense because what is important is the complete chain from suppliers to customers. This is acknowledged in the idea of value networks:



Value networks recognise that few companies stand alone and that what is ultimately supplied to and paid for by customers depends on activities carried on by many suppliers, distributors and, indeed, logistical companies. Ultimately, customer satisfaction and value added depend on all parties working well together.

## THE SUPPLY CHAIN AND SUPPLY CHAIN MANAGEMENT

There is no generally accepted definition of the term 'supply chain management' and many different definitions can be found in relevant literature. For example:

'A concept whose primary objective is to integrate and manage the sourcing, flow and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers.' *La Londe and Masters (1994)*

'The objective of managing the supply chain is to synchronise the requirements of the customer with the flow of materials from suppliers in order to effect a balance between what are often seen as conflicting goals of high customer service, low inventory management, and low unit cost.' *Stevens (1989)*

'...an integrative philosophy to manage the flow of a distribution channel from supplier to the ultimate user.' *Cooper et al (1997)*

From these definitions, it can be seen that supply chain management has the following features:

- Integrating and managing the sourcing, flow and control of materials.
- Supply chain management covers the flow of materials suppliers through to customers
- Potentially many suppliers and customers.
- Synchronising of materials received, processed and despatched to customers.
- Simultaneously achieving good levels of customer service and low costs for the company.

Supply chains are often divided into upstream and downstream operations in an analogy with material floating down a river, into and then out of operations:

- Upstream – the flow of materials into the organisation.
- Downstream – the flow of materials from the organisation to the customers.

However, these terms might sometimes have to be interpreted liberally as materials can go directly from supplier to customer with the organisation itself acting as a co-ordinator of the flow.

For businesses that manufacture their own products, the upstream supply chain will be taken to consist of the following value chain activities:

- Procurement – purchasing inputs such as supplies, material and equipment.
- Inbound logistics – receiving raw materials, holding inventory and issuing to manufacturing operations as required.

Downstream supply chain will be assumed to consist of:

- outbound logistics – the storing and distribution of finished goods.
- marketing and sales – identifying customer needs and generating sales.
- services.

You will note that procurement and marketing and sales do not themselves involve any movement of goods, but these activities initiate the flows of raw materials, components and finished products, so need to be included as part of supply chain management. Service can also be included here as certainly the supply of elements such as consumables, maintenance and training can be valuable sources of value added and need to be managed.

A useful view of supply chain management is suggested by Meyr, Wagner and Rohde (2004):



Here, in contrast to Porter:

- procurement is seen as a primary activity and will include inbound logistics, or their equivalent. Procurement is a central part of the supply chain and not merely a support function. Wise and skilled purchasing, as well as the physical movement of goods, will be capable of creating value
- customer-facing activities (previously, sales, marketing and services) are combined into sales
- 'production' is used instead of 'operations' in Porter's value chain. This is more precise (but perhaps more restricted).

The important additional emphasis in this presentation is on collaboration between up-stream suppliers and the down-stream customers. Together, they form the value network that creates value through the appropriate operation of the whole chain to improve efficiency, delivery accuracy and times, cost reduction and inventory minimisation.

You will readily understand that collaboration can often be greatly facilitated by the use of information technology, which can integrate online orders received from customers with manufacturing inventory management and purchases of raw materials and components from suppliers.

## **PUSH/PULL SUPPLY CHAIN MODELS**

A push model of the supply chain relies on manufacturers producing according to historical demand patterns and pushing products out to distributors and customers. Inventory is held at various points as a buffer against unexpected demand or production delays. By contrast, in a pull model demand stimulates production and delivery. Essentially, just-in-time inventory control is a pull model as ordering and production are triggered by customers' orders. No orders are raised nor production started until there is downstream demand.

Of course, pure push or pull models exist only in theory: demand for a product will never cause a supply chain to start mining iron ore and producing steel. Nor will a push model guarantee that products made will be bought. At some point, in every supply chain, demand push will meet demand pull, and inventory will accumulate there. Note that large geographical distances between suppliers and customers, or processes that take time (such as growing crops) make pull systems more difficult to organise.

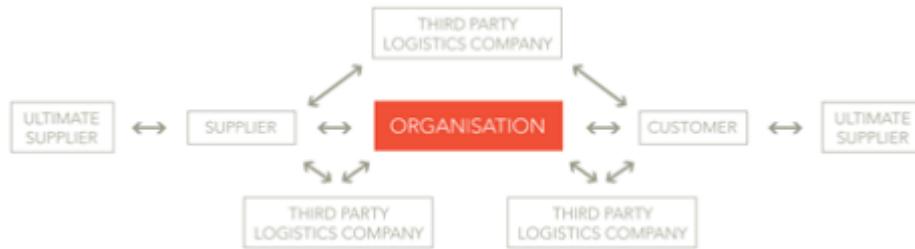
However, inventory can be minimised and customer service improved if all parties in the supply chain can be better synchronised and have the ability to react quickly. For example, a traditional model of replenishing inventory in supermarkets would rely on each supermarket issuing an order to suppliers, probably by electronic data interchange (EDI), once inventory falls below reorder level. However, orders then arrive 'out-of-the-blue' at suppliers, who either have to have sufficient production capacity or who have to hold inventories to respond quickly. A better way is to give suppliers access to supermarkets' inventory records through an extranet so that inventory levels and rates of change can be monitored. Supplies can be dispatched even without having to wait for an order. In this way, suppliers will be much better able to anticipate demand and produce accordingly. Better synchronisation and lower inventory levels have been achieved.

Information technology is of great assistance in moving towards a pull model as it influences the downstream supply chain through the 6I's of e-business:

- Intelligence – for example, internet sites can track user activity and from that analyse which products are growing or falling in popularity. Information can be fed directly into a data warehouse for subsequent analysis and data mining.
- Interactivity – internet customers can customise their purchases. For example, some computer companies build to order allowing different combinations of hardware and software to be chosen.
- Integration – following on from interactivity, once an order has been placed, the pull process can begin by scheduling component ordering, production and despatch.
- Individualisation – for example, relevant offers can be made to each customer. If someone has bought a particular printer, then subsequently offers can be made to sell ink or toner cartridges.
- Independence (from location) – the location of the supplier is largely irrelevant provided a good procurement and distribution system is in place. This is covered further below under logistics.
- Industry (structure) – fast responses to customer demand is liable to affect industry structure as it will often favour larger, better-organised companies who make use of sophisticated ordering and delivery solutions. There are fewer and fewer places in which poor performers can hide.

## **SUPPLY CHAIN CHOICES**

Supply chain pathways can be complex:



As with many other functions, outsourcing is increasingly used in supply chain management. Logistics companies can perform many supply chain functions more efficiently and economically than they can be done in-house, and we will see some examples below.

Some of the main choices to be made in supply chain pathways are as follows.

(1) Who transports the goods? The main solutions are:

- the buyer transfers them using own transport
- the seller transfers them using own transport
- a logistics company transfers them

(2) What delivery pathways are best?

(3) Who stores the goods? The organisation, the supplier, or a logistics company.

(4) Which manufacturing, packaging, labelling, kitting, or completion tasks are carried out by the organisation and which by other parties? (Kitting relates to processes such as adding batteries).

(5) Who is responsible for quality assurance and proper handling of the goods?

(6) How should returns be handled?

(7) How can fast and responsive deliveries be arranged?

(8) Who handles customs clearance?

## SUPPLY CHAIN EXAMPLES

*Pharmaceutical:* Many pharmaceuticals, such as insulin and flu vaccines, are temperature-sensitive and have to be stored below, say, 5°C to maintain their efficacy and safety. Manufacturers therefore need ensure that their worldwide distribution, by air and road, to hospitals and pharmacies can be guaranteed to have complied with the storage required and that this can be verified and demonstrated. It is not realistic for pharmaceutical companies to carry out such specialised distribution themselves on a worldwide basis, as this would imply refrigerated warehouses, air freight and transportation in every country supplied. Many logistics companies offer suitable services.

*Packaging:* Transporting packaging is wasteful, adding both weight and volume to products. Therefore, an efficient distribution solution can be to export the basic products and then package those locally with using language-specific packaging.

Once again, it can be inefficient for manufacturers to do this and frequently logistics companies carry out locally the packaging, printing instructions and labelling.

*Customs clearance:* Each country tends to have its own import regulations and tariffs. Navigating through these requires considerable local expertise and logistics companies are often used to facilitate the efficient international movement of goods.

*Distribution:* Imagine you distribute a product throughout Europe and customers need stock replenished frequently and quickly. One solution would be to set up your own warehouses and distribution vehicles in every country. However, you will realise that this would require vast resources. Almost certainly it would be better to outsource this to a logistics company as that is likely to enjoy great economies of scale. The logistics company can both warehouse the goods locally and provide transport to customers allowing a more just-in-time approach to be taken.

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