CHAPTER 1

Logistics and the supply chain

Objectives

The intended objectives of this chapter are to:

- **identify and explain logistics definitions and concepts that are relevant to managing the supply chain;**
- **identify how supply chains compete in terms of time, cost and quality;**
- **show how different supply chains may adopt different and distinctive strategies for competing in the marketplace.**

By the end of this chapter you should be able to understand:

- **how supply chains are structured;**
- **different ways in which supply chains may choose to compete in the marketplace;**
- **the need to align supply chain capabilities with the needs of the end-customer.**

Introduction

A car takes only 20 hours or so to assemble, and a couple more days are needed to ship it to the customer via the dealers. So why does it take more than a month for a manufacturer to make and deliver the car I want? And why are the products I want to buy so often unavailable on the shelf at the local supermarket? These are questions that go to the heart of logistics management and strategy. Supply chains today are slow and costly compared with what they will be like in a few years' time. But let us start at the beginning, by thinking about logistics and the supply chain in terms of what they are trying to do. It is easy to get bogged down in the complexities of how a supply chain actually works (and very few people actually know how a whole supply chain works!). We shall address many of those details later in this book. First, let us focus on how a supply chain competes, and on what the implications are for logistics management and strategy.

The overall aim of this chapter is to provide an introduction to logistics, and to set the scene for the book as a whole. The need is to look outside the individual organisation and to consider how it aligns with other organisations in a given supply chain. This is both a strategic and a managerial task: strategic, because it brings in long-term decisions about how logistics will be structured and the sys-

tems it will use; managerial, because it encompasses decisions about sourcing, making and delivering products and services within an overall 'game plan'.

Key issues

This chapter addresses four key issues:

1 **Logistics and the supply chain:** definitions, structure, tiering.

2 **Material flow and information flow:** the supply chain and the demand chain.

3 **Competing through logistics:** competitive criteria in the marketplace.

4 **Logistics strategies:** aligning capabilities across the supply chain.

1.1 Logistics and the supply chain

***Key issues:* What is the supply chain, and how is it structured? What is the purpose of a supply chain?**

Logistics is a big word for a big challenge. Let us begin by giving an example of that challenge in practice, because that is where logistics starts and ends.

CASE STUDY 1.1

Tesco

Tesco is the UK's largest food retailer, with a sales turnover of more than €67.5 billion. While it has some 638 stores in central Europe, and some 636 in the Far East, most are in the United Kingdom and Northern Ireland, where it has nearly 1,800. This number has increased rapidly as Tesco entered the convenience store market with deals such as the Tesco Express alliance with Esso to run grocery shops at petrol stations. The product range held by the stores has grown rapidly in recent years, and currently stands at 65,000 stock-keeping units (skus) depending on the size of the store as Tesco broadens its presence in the 'non-food' market for electrical goods, stationery, clothing and the like. This massive range is supported by 3,000 suppliers, who are expected to provide service levels (correct time and quantities) of at least 98.5 per cent by delivering to Tesco within half-hour time 'windows'. Volumes are equally impressive. In a year, some 2.5 billion cases of product are shipped from suppliers to the stores.

Tesco states that its core purpose is 'to create value for customers to earn their lifetime loyalty'. Wide product range and high on-shelf availability across that range are key enablers of that core purpose. So how do you maintain high availability of so many skus in so many stores? This question goes to the heart of logistics management for such a vast organisation. Logistics is about material flow, and about information flow. Let us look at how Tesco deals with each of these in turn.

An early reform for supermarket operation was to have suppliers deliver to a distribution centre rather than to every store. During the 1980s, distribution to retail stores was handled by 26 depots. These operated on a single-temperature basis, and were small and relatively inefficient. Delivery volumes to each store were also relatively low, and it was not economic to deliver to all stores each day. Goods that required temperature-controlled environments had to be carried on separate vehicles. Each product group had different ordering systems. The network of depots simply could not handle

the growth in volume and the increasingly high standards of temperature control. A new distribution strategy was needed.

Under the 'composite' distribution system, many small depots with limited temperature control facilities were replaced by composite distribution centres (called regional distribution centres, RDCs), which can handle many products at several temperature ranges. The opportunity is to provide a cost-effective daily delivery service to all stores. Typically, a composite distribution centre can handle over 60 million cases per year on a 15-acre site. The warehouse building comprises 25,000 square metres divided into three temperature zones: frozen (−25°C), +2°C (chilled) and +12°C (semi-ambient). Each distribution centre (DC) serves a group of between 100 and 140 retail stores. Delivery vehicles for composite depots can use insulated trailers divided into chambers by means of movable bulkheads so they can operate at different temperatures. Deliveries are made at agreed, scheduled times. Ambient goods such as cans and clothing are delivered through a separate grocery distribution network which relies on a stocked environment where orders are picked by store. This operation is complemented by a strategically located trunking station which operates a *pick to zero* operation for fast-moving grocery on merchandise units that can be placed directly on the shop floor.

So much for the method of transporting goods from supplier through to the stores, but how much should be sent to each store? With such a huge product range today, it is impossible for the individual store to reorder across the whole range (store-based ordering). Instead, sales of each product line are tracked continuously through the till by means of electronic point of sale (EPOS) systems. As a customer's purchases are scanned through the bar code reader at the till, the sale is automatically recorded for each sku. Cumulative sales are updated every four hours on Tesco Information Exchange (TIE). This is a system based on Internet Protocol that allows Tesco and its suppliers to communicate trading information. The aim of improved communication is to reduce response times from manufacturer to stores and to ensure product availability on the shelf. Among other things, TIE aims to improve processes for introducing new products and promotions, and to monitor service levels.

Based on the cumulative sales, Tesco places orders with its suppliers by means of electronic data interchange (EDI). As volumes and product ranges increased during the 1990s, food retailers such as Tesco aimed to destock their distribution centres by ordering only what was needed to meet tomorrow's forecast sales. For fast-moving products such as types of cheese and washing powders, the aim is *day 1 for day 2*: that is, to order today what is needed for tomorrow. For fast-moving products, the aim is to *pick to zero* in the distribution centre: no stock is left after store orders have been fulfilled and deliveries to stores are made as soon as the product is picked, which increases the stock availability for the customer. The flow of the product into the distribution centre is broken into four waves and specific products are delivered in different cycles through the day. This means that the same space in the distribution centre can be used several times over.

Questions

1 Describe the key logistics processes at Tesco.

2 What do you think are the main logistics challenges in running the Tesco operation?

So why is Tesco growing in an intensely competitive market? It describes its core purpose as being 'to create value for customers to earn their lifetime loyalty'. *Loyalty* is an important term that we return to in the next chapter. In order to achieve loyalty, Tesco has to understand customer needs and how they can be served. Its products must be recognised by its customers as representing outstanding value for money. To support such goals, it must ensure that the products that its customers want are available on the shelf at each of its stores at all times, day and night. Planning and controlling the purchase and distribution of Tesco's massive product range from suppliers to stores is one of logistics. Logistics is the task of managing two key flows:

- *material flow* of the physical goods from suppliers through the distribution centres to stores;
- *information flow* of demand data from the end-customer back to purchasing and to suppliers, and supply data from suppliers to the retailer, so that material flow can be accurately planned and controlled.

The logistics task of managing material flow and information flow is a key part of the overall task of *supply chain management*. Supply chain management is concerned with managing the entire chain of processes, including raw material supply, manufacture, packaging and distribution to the end-customer. The Tesco UK supply chain structure comprises three main functions:

- *distribution*: the operations and support task of managing Tesco's distribution centres, and the distribution of products from the DCs to the associated stores;
- *network and capacity planning*: the task of planning and implementing sufficient capacity in the supply chain to ensure that the right products can be procured in the right quantities now and in the future;
- *supply chain development*: the task of improving Tesco's supply chain so that its processes are stable and in control, that it is efficient, and that it is correctly structured to meet the logistics needs of material flow and information flow.

Thus logistics can be seen as part of the overall supply chain challenge. While the terms 'logistics' and 'supply chain management' are often used interchangeably, logistics is actually a subset of supply chain management. It is time for some definitions.

1.1.1 Definitions and concepts

A supply chain as a whole ranges from basic commodities (what is in the ground, sea or air) to selling the final product to the end-customer to recycling the used product. Material flows from a basic commodity (such as a bauxite mine as a source of aluminium ore) to the finished product (such as a can of cola). The can is recycled after use. The analogy to the flow of water in a river is often used to describe organisations near the source as *upstream*, and those near the end-customer as *downstream*. We refer to each firm in a supply chain as a partner, because that is what they are. There is a collective as well as an individual role to play in

the conversion of basic commodity into finished product. At each stage of the conversion, there may be *returns* which could be reject material from the preceding firm, or waste like the finished can that needs to be recycled.

A supply chain is a network of partners who collectively convert a basic commodity (upstream) into a finished product (downstream) that is valued by end-customers, and who manage returns at each stage.

Each partner in a supply chain is responsible directly for a process that *adds value* to a product. A process:

Transforms *inputs* in the form of materials and information into *outputs* in the form of goods and services.

In the case of the cola can, partners carry out processes such as mining, transportation, refining and hot rolling. The cola can has *greater value* than the bauxite (per kilogram of aluminium).

Supply chain management involves *planning and controlling* all of the processes from raw material production to purchase by the end-user to recycling of the used cans. Planning refers to making a plan that defines how much of each product should be bought, made, distributed and sold each day, week or month. Controlling means keeping to plan – in spite of the many problems that may get in the way. The aim is to coordinate planning and control of each process so that the needs of the end-customer are met correctly. The definition of supply chain management used in this book is as follows:

Planning and controlling all of the business processes – from end-customer to raw material suppliers – that link together partners in a supply chain in order to serve the needs of the end-customer.

'Serve the needs of the end-customer' has different implications in different contexts. In not-for-profit environments such as public health and local government, serving implies 'continuously improving', 'better than other regions/countries', 'best value' and the like. In the commercial sector, serving implies 'better than competition', 'better value for money' and so on. In either situation, the focus of managing the supply chain as a whole is on *integrating* the processes of supply chain partners, of which the end-customer is the key one. In effect, the end-customer starts the whole process by buying finished products. It is this behaviour that causes materials to flow through the supply chain (Gattorna, 1998: 2).

The degree to which the end-customer is satisfied with the finished product depends crucially on the management of material flow and information flow along the supply chain. If delivery is late, or the product has bits missing, the whole supply chain is at risk from competitors who can perform the logistics task better. Logistics is a vital enabler for supply chain management. We use the following definition of logistics in this book:

The task of coordinating material flow and information flow across the supply chain.

Logistics has both *strategic* (long-term planning) and *managerial* (short- and medium-term planning and control) aspects. Tesco has a clear view about the

opportunities here. A breakdown of costs in Tesco's part of the UK supply chain is as follows:

- Supplier delivery to Tesco distribution centre (DC) 18%
- Tesco DC operations and deliver to store 28%
- Store replenishment 46%
- Supplier replenishment systems 8%

Nearly half of supply chain costs are incurred in-store. In order to reduce these in-store costs, Tesco realises that the solution is 'to spend more upstream and downstream to secure viable trade-offs for in-store replenishment'. If a product is not available on the shelf, the sale is potentially lost. By integrating external manufacturing and distribution processes with its own, Tesco seeks to serve the needs of its customers better than its competitors.

1.1.2 Supply chain: structure and tiering

The concept of a supply chain suggests a series of processes linked together to form a chain. A typical Tesco supply chain is formed from five such links.

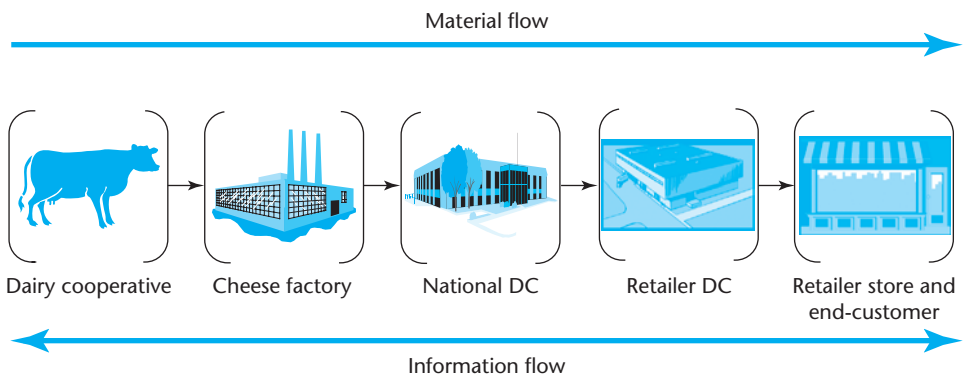


Figure 1.1 **From cow to customer**

Here, milk is produced by a dairy cooperative and shipped to a cheese factory. Once made, the cheese is shipped to the manufacturer's national distribution centre (NDC), where it is stored and matured for nine months. It can then be shipped in response to an order from the retailer, and is transported first to the retailer's regional distribution centre (RDC). From there, it is shipped to store. Looking at the arrows in Figure 1.1, material flows from left to right. Information is shared across the chain: it is demand from the end-customer that makes the whole chain work.

If we look more closely at what happens in practice, the term 'supply chain' is somewhat misleading in that the 'chain' represents a simple series of links between a basic commodity (milk in this case) and a final product (cheese). Thus

the cheese manufacturer will need packaging materials such as film, labels and cases. Cheese requires materials additional to milk in the manufacturing process. So the manufacturer deals with suppliers other than the milk cooperative alone. Once made, the cheese is dispatched for maturation to the supplier's NDC, and then dispatched to many customers in addition to Tesco. Once at a Tesco RDC, the 'chain' spreads again because up to 100 stores are served by a given RDC. The additional complexity prompts many authors to refer to *supply networks* rather than to supply chains, a point we return to shortly.

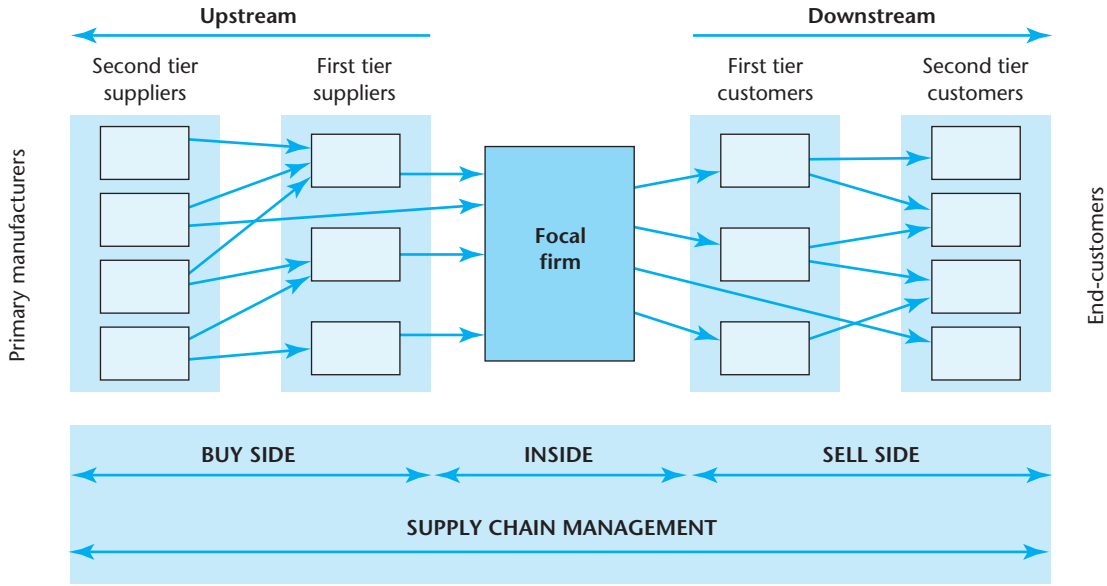


Figure 1.2 **Supply network**
(Source: After Slack *et al.*, 1997)

A more realistic representation of the supply chain is shown in Figure 1.2, where each link can connect with several others. A *focal firm* is shown at the centre of many possible connections with other supplier and customer companies.

The supply chain can be seen in this diagram as a number of processes that extend across organisational boundaries. The focal firm is embedded within the chain, and its operational processes ('inside') must coordinate with others that are part of the same chain. Materials flow from left (upstream, or 'buy side') to right (downstream, or 'supply side'). If everything is as orderly as it seems, then only the end-customer (to the extreme right of the chain) is free to place orders when he or she likes: after that, the system takes over.

The supply chain is *tiered* in that supply side and demand side can be organised into groups of partners with which we deal. Thus if we place an assembler such as the Ford plant at Valencia as the focal firm, buy side comprises tier 1 suppliers of major parts and subassemblies who deliver directly to Ford, while tier 2 suppliers deliver to the tier 1s, etc. On the sell side, Ford supplies to the national sales companies as tier 1 customers, who in turn supply to main dealers as tier 2, and so on.

Other terms that are used to describe aspects of managing the supply chain are:

- *Purchasing and supply* deals with a focal firm's immediate suppliers (upstream).
- *Physical distribution* deals with the task of distributing products to tier 1 customers (downstream).
- *Logistics* refers to management of materials and information. Inbound logistics deals with links between the focal firm and its upstream ('buy side') suppliers, while outbound logistics refers to the links between the focal firm and its downstream ('sell side') customers.

Supply chain management thus appears as the 'end to end' (or 'cow to customer' as we have expressed it in Figure 1.1) management of the network as a whole, and of the relationships between the various links. The essential points were summarised long ago by Oliver and Webber (1982):

- Supply chain management views the supply chain as a *single entity*.
- It demands strategic decision making.
- It views *balancing inventories* as a last resort.
- It demands *system integration*.

A natural extension of this thinking is that supply chains should rather be viewed as *networks*. Figure 1.3 shows how a focal firm can be seen at the centre of a network of upstream and downstream organisations.

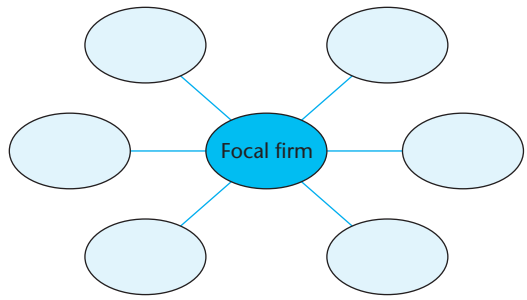


Figure 1.3 **A network of organisations**

The terms 'supply chain' and 'supply network' both attempt to describe the way in which buyers and suppliers are linked together to serve the end-customer. 'Network' describes a more complex structure, where organisations can be cross-linked and there are two-way exchanges between them; 'chain' describes a simpler, sequential set of links (Harland *et al.*, 2001). We have used the terms interchangeably in this book, preferring 'chain' to describe simpler sequences of a few organisations and 'network' where there are many organisations linked in a more complex way.

Figure 1.3 takes a basic view of the network, with a focal firm linked to three upstream suppliers and three downstream customers. If we then add material flow and information flow to this basic model, and place a boundary around the network, Figure 1.4 shows the network in context. Here we have added arrows showing the logistics contribution of material and information flows, together with the

time dimension. Material flows from primary manufacture (for example farming, mining or forestry) through various stages of the network to the end-customer. Material flow represents the *supply* of product through the network in response to demand from the next (succeeding) organisation. Information flow broadcasts *demand* from the end-customer to preceding organisations in the network. The time dimension addresses the question 'How long does it take to get from primary source to the end-customer?' That is, how long does it take to get product through the various stages from one end of the supply chain to the other? Time is important because it measures how quickly a given network can respond to demand from the end-customer. In fact, the concept of flow is based on time:

Flow measures the quantity of material (measured in input terms such as numbers of components, tonnes and litres) that passes through a given network per unit of time.

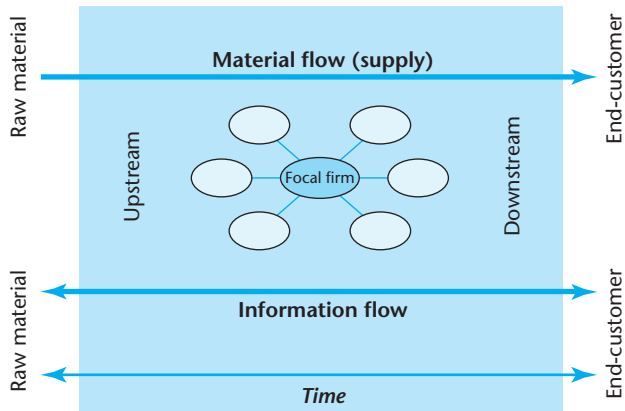


Figure 1.4 **The network in context**

Activity 1.1

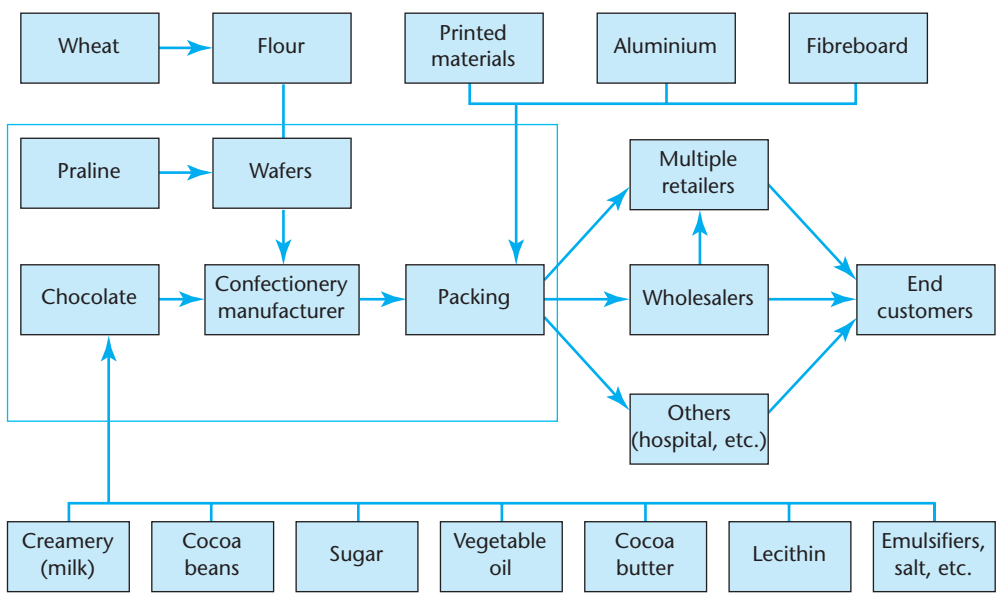


Figure 1.5 **Example of a confectionery network map**

(Source: After Zheng *et al.*, 1998)

Figure 1.5 shows an example network map of a chocolate bar. Draw a network map showing how your organisation, or one that you know well, links with other organisations. Explain the upstream and downstream processes as far as you can. We expect you to address at least the first tiers of demand and supply. You will derive further benefit from researching additional tiers, and by developing the linkage of relationships that is involved. Explain how these work in practice, and how materials flow between the different tiers.

An important point here is that the supply network should be viewed as a *system*. All processes within the network need to be understood in terms of how they interact with other processes. No organisation is an island: its inputs and outputs are affected by the behaviour of other players in the network. One powerful, disruptive player can make life very difficult for everyone else. For example, several auto assemblers optimise their own processes, but disrupt those of upstream suppliers and downstream distributors. The effect is to increase total system costs *and* reduce responsiveness to end-customer demand.

1.2 Material flow and information flow

Key issue: **What is the relationship between material flow and information flow?**

As we have already seen, logistics is about managing material flow and information flow. In this section, we examine material flow and information flow in more detail.

1.2.1 Material flow

The aim within a supply chain must be to keep materials flowing from source to end-customer. The time dimension in Figure 1.4 suggests that parts are moved through the supply chain as quickly as possible. And in order to prevent local build-ups of inventory, flow must be orchestrated so that parts move in a coordinated fashion. The term often used is *synchronous*. Caterpillar Inc. makes complex earth-moving equipment, and there are literally thousands of component parts and subassemblies that must come together in the final assembly processes. The vision is that parts and subassemblies should flow continuously through the supply chain, all orchestrated like a ballet (Knill, 1992: 54):

> **The goal is continuous, synchronous flow. Continuous means no interruptions, no dropping the ball, no unnecessary accumulations of inventory. And synchronous means that it all runs like a ballet. Parts and components are delivered on time, in the proper sequence, exactly to the point they're needed.**

Often it is difficult to see the 'end to end' nature of flow in a given supply chain. The negative effects of such difficulty include build-ups of inventory and sluggish

response to end-customer demand. And sheer greed by the most powerful members of a supply chain often means that it is weaker partners (notably small to medium-sized enterprises – SMEs) who end up holding the inventories. So management strategies for the supply chain require a more holistic look at the links, and an understanding that organisational boundaries easily create barriers to flow.

Case study 1.2 describes how one company – Xerox in this case – re-engineered material flow in its distribution system.

CASE STUDY 1.2

Xerox

Once the problems of introducing 'just-in-time' production systems had been solved at the Xerox plant making photocopiers at Venray in Holland, attention shifted towards the finished product inventory. Historically, stocks of finished products had been 'managed' by trying to turn the tap of sales on or off as stocks developed. This was characterised by the familiar 'feast or famine' situations. The objective of the next move for Xerox became clear: making only what you need when you need it, then shipping direct to the customer. But the key question had to be answered: just-in-time for what? The answer is – the end-customer. And customer surveys showed that three types of delivery were needed:

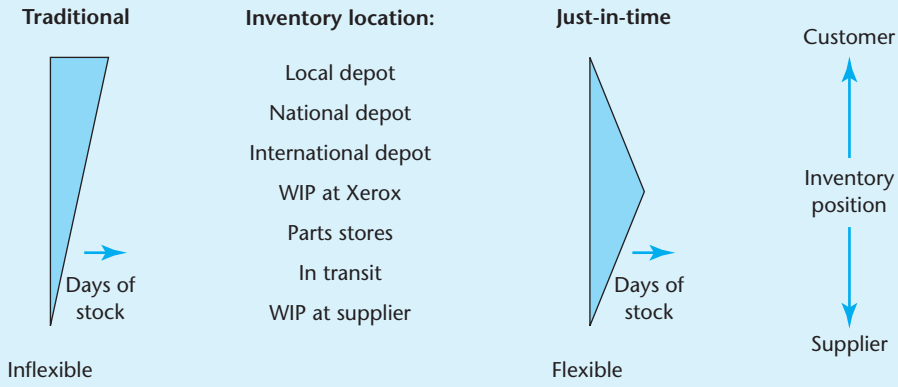
- Commodity products should be delivered 'off the shelf'.
- Middle-range products were required in five days.
- Larger products that had to be integrated into existing customer processes and systems had to be planned months ahead: but the quoted delivery date had to be met 100 per cent.

It was envisaged that this would lead to a radically different inventory 'profile' in the supply chain. Figure 1.6 shows a traditional inventory profile on the left. Most of the stock was held in local depots waiting for customer orders. If the mix had been incorrectly forecast, too many of the wrong products were in plentiful supply, while needed products were unavailable. Further, a batch of replacement products would take a long time to fight their way through the pipeline. A new 'just-in-time' strategy was conceived to make the supply chain much more responsive. This strategy had a profound effect on the inventory profile, pushing much of the inventory away from the end-customer (where it has maximum added value and is already committed to a given finished product specification). Instead, inventory was mostly held further upstream, where it could be finally assembled to known orders, and where it had lower value. Of course, it has since been possible to remove several of the stages of the distribution process, thereby eliminating some of the sources of inventory altogether.

For commodity products, Xerox coined the term *deliver JIT*: that is, the product had to be delivered out of stock. Where sales forecasts are traditionally poor, the challenge was one of flexibility, simplicity and speed of manufacture. For mid-range products, it was unrealistic to hold 'just in case' inventories of products that are too complex to be assembled quickly. Instead, *finish JIT* was the term coined to describe the new policy of building semi-finished products with the minimum of added value, consistent with being able to complete and deliver the product in the five-day target. Finally, *build JIT*

▶

was the term used to describe the new philosophy of building larger products quickly within a defined lead time.



Note: WIP = work in progress, i.e. products being worked on, but not yet ready for sale.
Shaded areas indicate days of stock.The wider the area, the more days of stock in that position.

Figure 1.6 Xerox: the impact on inventories

The impact of the new build philosophies on the downstream supply chain processes can be judged from Figure 1.6. While the traditional inventory profile shows a maximum number of days of stock (shown in the shaded area) at finished product level, this is risky. It always seems that demand is greatest for the very items that are not available! *Postponing* the decision on exact specification until as late as possible in the process, when we are more likely to know precisely what the end-customer wants, helps to create the much flattened inventory profile to the right of the diagram. These are issues to which we return in Chapters 6 and 7. (A development of this case, tracking 'what happened next', is Case Study 7.12.)

(Source: After Eggleton, 1990)

Questions

1 How did inventory reduction in the supply chain lead to improved competitiveness at Xerox?

1.2.2 Information flow

As asked in the Xerox case study, just-in-time *for what*? It is all well and good to get materials flowing and movements synchronised, but the 'supply orchestra' needs to respond in unison to a specific 'conductor'. The 'conductor' in this analogy is actually the end-customer, and it is the end-customer's demand signals that trigger the supply chain to respond. By sharing the end-customer demand information across the supply chain, we create a *demand chain*, directed at providing enhanced customer value. Information technology enables the rapid sharing of demand and supply data at increasing levels of detail and sophistication. The aim is to *integrate* such demand and supply data so that an increasingly accurate picture is obtained about the nature of business processes, markets

and end-customers. Such integration provides increasing competitive advantage, as we explore further in Chapter 8.

The greatest opportunities for meeting demand in the marketplace with a maximum of dependability and a minimum of inventory come from implementing such integration across the supply chain. A focal firm cannot become 'world class' by itself!

Figure 1.7 gives a conceptual model of how supply chain processes (supply, source, make, distribute and sell) are integrated together in order to meet end-customer demand (Beech, 1998). Demand signals are shared across the chain rather than being interpreted and massaged by the 'sell' process next to the market. Demand fulfilment is also envisaged as an integrated process, as materials are moved from one process to the next in a seamless flow. Information is the 'glue' that binds the supply chain processes together.

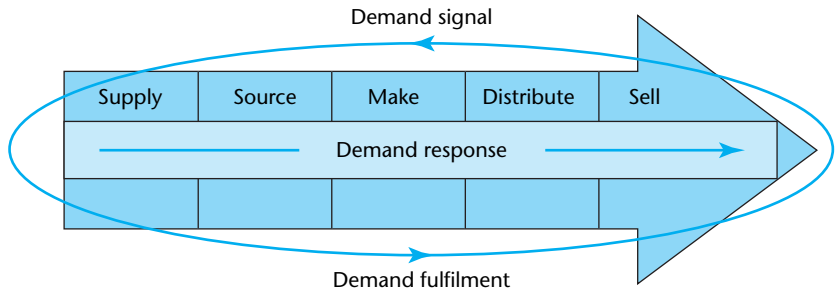


Figure 1.7 Integrating demand and supply chains

(Source: After Beech, 1998)

Activity 1.2

Write a brief (200 words) appraisal of material and information flow in the supply network affecting one of the major products in the response you gave in Activity 1.1. Perhaps the current situation is different from the above ideals?

1.3 Competing through logistics

***Key issues:* How do products win orders in the marketplace? How does logistics contribute to competitive advantage?**

There are many potentially conflicting demands on an organisation today. All those unreasonable customers seem to want it yesterday, at no cost, and to be compensated if it goes wrong! Within a given supply chain, it is important that each organisation understands how each group of products competes in the marketplace, and that it aligns its capabilities with those of its partners.

A 'product' is actually a combination of the *physical product* (for example, a 200g pack of Camembert cheese) and its accompanying *service* (for example, how it is merchandised in the store – easy to find, availability, attractive presentation,

lighting, temperature). While the physical product is determined by marketing and R&D, service is heavily influenced by logistics.

It is impossible to be outstanding at everything, and supply chain partners need to give priority to capabilities that give each product group its competitive edge. These are the advantages where supply chain partners 'dig in deep' by giving priority to investment by training and by focusing product development and marketing efforts. They need only to match industry average performance on other criteria. Let us now look at the competitive priorities that can be delivered by logistics in the supply chain.

There are various ways in which products compete in the marketplace. Perhaps a given product is something that no one else can match in terms of price. Or maybe you offer a product that is technically superior, such as Gillette razor blades. While new product development has logistics implications, the key advantage provided by logistics – as suggested in the Tesco example in section 1.1 – is *availability of conforming product in the marketplace at low cost*. Logistics supports competitiveness of the supply chain as a whole by:

> **meeting end-customer demand through supplying what is needed in the form it is needed, when it is needed, at a competitive cost.**

Logistics advantage thus shows up in the form of such competitive factors as better product availability in the marketplace and low product obsolescence. Defining logistics advantage means that we need to set goals that are clear, measurable and quantifiable. We distinguish three 'hard objectives' for creating logistics advantage: *quality, time and cost*. There are two further important ways of creating logistics advantage: *controlling variability* in logistics processes, and *dealing with uncertainty*. We have called these 'supportive capabilities', and they can be just as important as hard objectives. Finally, there are 'soft objectives', which relate to service aspects such as the confidence customers develop in the way the logistics operation is performed. Let us look at each of these ways of creating advantage in turn.

1.3.1 Hard objectives

Traditional ways of competing are to offer the end-customer advantages related to product quality, the speed with which it is delivered, and/or the price at which it is offered. We refer to quality, time and cost as 'hard objectives' because they are easy to measure and relatively obvious to the end-customer.

The quality advantage

The most fundamental objective – in that it is a foundation for the others – is to carry out all processes across the supply chain so that the end product does what it is supposed to do. Quality is the most visible aspect of supply chain performance. Defects, incorrect quantities and wrong items delivered are symptoms of quality problems in supply chain processes that are all too apparent to the end-customer. Such problems negatively influence that customer's loyalty. Robust

processes are at the heart of supply chain performance. Internally, robust processes help to reduce costs by eliminating errors, and help to increase dependability by making processes more certain.

While conformance quality in the factory may be controlled to defect levels that are below 25 parts per million (ppm), a product may end up on the retailer's shelf with between 2 and 5 per cent defects, which is 10,000 to 20,000 ppm. This huge escalation takes place as the result of cumulative problems in successive supply chain processes. Cases may be squashed when shrink-wrapped at the manufacturer's NDC. In the back of the retail store, cases may be cut open with a sharp knife – in spite of instructions to the contrary. The end-customer sees the product on the retail shelf at its *worst* state of quality performance, and that is where the buying decision is made that drives the supply chain as a whole.

In many logistics situations, quality of service is about selecting the right quantity of the right product in the right sequence in response to customer orders. For example, store orders must be picked from a range of thousands of skus (stock keeping units) at a Tesco RDC. This must be carried out accurately (correct sku, correct quantity) against tight delivery schedules day in day out. *Pick accuracy* (for example, 99.5 per cent correct sku and correct quantity) is widely used to measure the quality of this operation. And increasing requirements for in-store efficiencies mean that categories of product (for example, shampoos and toothpastes) need to be picked in a set sequence to facilitate direct-to-shelf delivery at the store. Logistics service providers who can implement and maintain the highest standards of service quality place themselves at an advantage over those who cannot.

The time advantage

Time measures how long a customer has to wait in order to receive a given product or service. Volkswagen calls this time the *customer to customer* lead time: that is, the time it takes from the moment a customer places an order to the moment that customer receives the car he or she specified. Such lead times can vary from zero (the product is immediately available, such as goods on a supermarket shelf) to months or years (such as the construction of a new building). Competing on time is about survival of the fastest!

Time can be used to win orders by companies who have learned that some customers do not want to wait – and are prepared to pay a premium to get what they want quickly. An example is Vision Express, which offers prescription spectacles 'in about one hour'. Technicians machine lenses from blanks on the premises. Staff are given incentives to maintain a 95 per cent service level against the one-hour target. Vision Express has been successful in the marketplace by re-engineering the supply chain so that parts and information can flow rapidly from one process to the next. Compare this with other opticians in the high street, who must send customer orders to a central factory. Under the 'remote factory' system, orders typically take about 10 days to process. An individual customer order is first dispatched to the factory. It then has to join a queue with orders from all the other high street branches around the country. Once the order has been processed, it must return to the branch that raised the order. While this may

be cheaper to do (a central, highly productive factory serves all of the branches), it takes much longer to process an order.

The time advantage is variously described as *speed* or *responsiveness* in practice. Speeding up supply chain processes may help to improve freshness of the end product, or to reduce the risk of obsolete or over-aged stock in the system. Time is an *absolute* measure, that is, it is not open to interpretation like quality and cost. By following a product through a supply chain, we can discover which processes add value and which add time and cost but no value. We explore this further in Chapter 5, which is about managing time for advantage in the supply chain.

The cost advantage

Cost is important for all supply chain processes – that goes without saying. Low costs translate into advantages in the marketplace in terms of low prices or high margins, or a bit of each. Many products compete specifically on the basis of low price. This is supported from a supply chain point of view by low cost manufacture, distribution, servicing and the like. Examples of products that compete on low price are 'own brand' supermarket goods that reduce the high margins and heavy advertising spend of major brands. They also perhaps cut some of the corners in terms of product specification in the hope that the customer will consider low price to be more important than minor differences in product quality.

The pressure to reduce prices at automotive component suppliers is intense. The assemblers have been setting annual price reduction targets for their inbound supply chains for some years. Unless a supplier can match reduced prices at which products are being sold by means of reduced costs, that supplier will gradually go out of business. As a result, many suppliers are cynical about the 'price down' policies of the assemblers. Reduced prices are the reward of cost cutting, and that is most often a collaborative effort by several partners in the supply chain. As indicated in section 1.1, Tesco can make only limited inroads into its in-store costs without the help of its supply chain partners. On the other hand, small dairy farmers continue to be forced out of business because the price of milk paid by supermarkets is 'less than the price of water'. For them, there are few opportunities to cut costs.

1.3.2 Supportive capabilities

While the hard objectives listed above are always important to competitive advantage, supportive capabilities can also be key to creating logistics advantage in the marketplace. When there is little to choose in terms of quality, time or cost, supportive capabilities can make all the difference to the end-customer. Variability refers to real and identifiable differences within a population, such as the differences in time each patient at an optician has to wait for their eyes to be tested. Uncertainty refers to our lack of knowledge (Thompson, 2002): in logistics terms, uncertainty results in us having to deal with events that are not known in advance.

Controlling variability: the dependability advantage

Time is not just about speed. Quality is not just about meeting defect targets. Behind both 'hard' objectives is the need to *control variability* in logistics processes. Variability undermines the *dependability* with which a product or service meets target. While Vision Express offers a one-hour service for prescription glasses, the 95 per cent service level is a measure of the dependability of that service against the one-hour target. Firms who do not offer instantaneous availability need to tell the customer – in other words to 'promise' – *when* the product or service will be delivered. Delivery dependability measures how successful the firm has been in meeting those promises. For example, the UK's Royal Mail offers a 'first class' service for letters whereby there is a 90 per cent probability that a letter posted today will reach its destination tomorrow. It is important to measure dependability in the same 'end to end' way that speed is measured. Dependability measures are widely used in industries such as train and air travel services to monitor how well published timetables are met. And in manufacturing firms, dependability is used to monitor a supplier's performance in such terms as:

- *on time* (percentage of orders delivered on time, and the variability against target);
- *in full* (percentage of orders delivered complete, and the variability against target);
- *on quality* (percentage of defects, and the variability against target).

So logistics is concerned not just with the *average* percentage of orders delivered on time but also with the *variability*. For example, a manufacturer has to cope with the day-to-day variability of orders placed. In practice, this is more important than the average orders placed because of the resource implications of 'ups and downs' in demand. Case study 1.3 explores the impact of variability on a supplier's processes.

CASE STUDY 1.3

Measuring schedule variability

A problem that is all too familiar to suppliers in the automotive industry is that of schedule variability. A vehicle manufacturer issues delivery schedules to specify how many parts of each type are required each day for the following month. And each day a 'call-off' quantity is issued, which specifies how many the vehicle manufacturer actually wants. The two sets of figures are not necessarily the same, although they usually add up to the same cumulative numbers for the month as a whole. In other words, the total scheduled quantities and the total call-off quantities are the same. So what is the problem?

The problem is that the supplier has to cope with ups and downs of call-off quantities that create huge problems for the supplier's process. Let scheduled demand = S, and call-off quantities = A. Then the difference D between schedule and actual is given by D = S – A. If the supplier produces to schedule, then S > A, the supplier will over-produce the part and end up with excess stock. Where S < A, the effects could either be a

reduction in stock held by the supplier, or a shortfall of (S – A) of parts from the supplier. The two conditions (S > A and S < A) therefore have different logistics implications.

Figure 1.8 shows that actual demand, totalled across four different parts at PressCo (a supplier of pressed metal components), may be up to 1,600 units above schedule, or 2,200 below schedule in the case of vehicle assembler WestCo. This range has been divided up into intervals of 100 units. The mode (0 – 99) indicates that S = A for a frequency of 18 per cent of the observations.

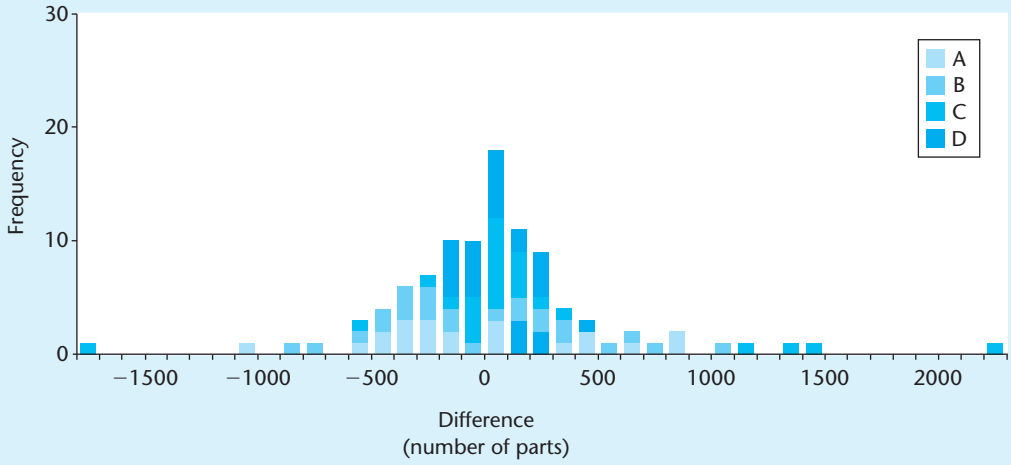


Figure 1.8 Distribution of differences between scheduled and actual demand for WestCo

Assuming that the distribution is roughly normal, the standard deviation (SD) is 573, which is characteristic of the flat, wide spread of data. Figure 1.9 shows the distribution of S – A for four similar parts from the same supplier but to a different vehicle assembler, EastCo. This time, the SD for the distribution is 95, representing a much narrower spread of differences than for WestCo.

(Source: Harrison, 1996)

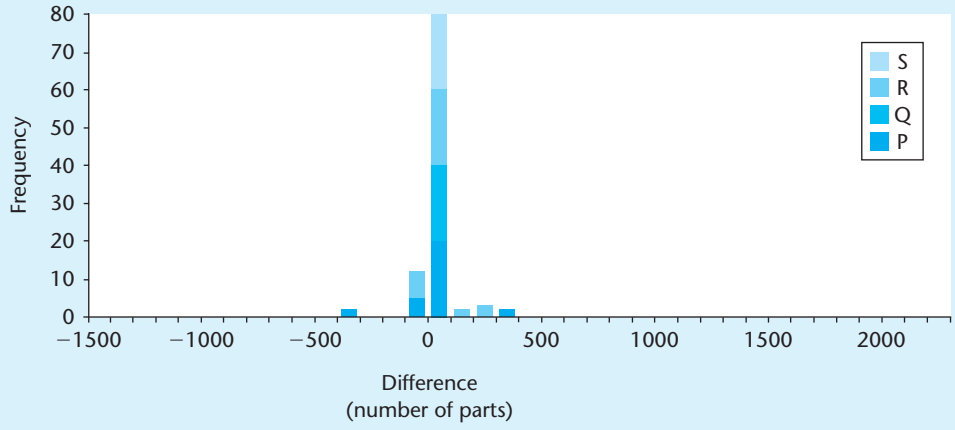


Figure 1.9 Distribution of differences between scheduled and actual demand for EastCo

Questions

1 What are the logistics implications to PressCo for delivery reliability to customers WestCo and EastCo?

2 What steps will the supplier need to take in order to satisfy call-off orders from WestCo?

3 If separate parts of the PressCo factory were dedicated to production for WestCo and for EastCo, which would be the more efficient in terms of labour costs and inventory holding?

Quality is not just about meeting target pick accuracy, or target defect levels. It is also about controlling variability. The same argument can be made about costs. The implication of dependability for logistics is that supply chain processes need to be robust and predictable. In Chapter 6, we develop the case for dependability in supply chains under the themes of planning and control and lean thinking.

Dealing with uncertainty: the agility advantage

Dealing with uncertainty means responding rapidly to unknown problems that affect logistics processes. Sometimes, problems can be foreseen – even if their timing cannot. Toyota UK manages inbound deliveries of parts from suppliers in southern Europe by a process called *chain logistics*. Trailers of parts are moved in four-hour cycles, after which they are exchanged for the returning empty trailer on its way back from the United Kingdom. One hitch in this highly orchestrated process means that incoming parts do not arrive just-in-time at the assembly plant. Toyota demands that its suppliers and logistics partner plan *countermeasures*. This means that alternative routes for suppliers to deliver to its Burnaston assembly plant in the UK have been planned in advance to deal, for example, with a French channel ferry strike at Calais. The weather is also a cause of uncertainty in logistics – for example, it may mean that Tesco has to switch between salads and soups as the result of a cold snap. Other forms of uncertainty concern events where neither the problem nor its timing can be foreseen. Case study 1.4 provides an example of such an event and how two organisations responded differently to it.

CASE STUDY 1.4

Nokia deals with uncertainty

In March, 2000, a thunderstorm struck the Philips semiconductor plant at Albuquerque in New Mexico, which made silicon chips for products like cellphones. Damage at first seemed minor, and fire fighters soon left the premises. At first, Philips told major customers like Nokia and Ericsson that the delay to production would only be one week. But damage to some of the clean areas in the plant – created by smoke and water – was actually going to take months to remedy. Clean rooms in semiconductor plants must be spotless, and particles of more than 0.5μ are filtered out.

The one-week delay was quickly reported by Tapio Markki, Nokia's chief component-purchasing manager, to Pertti Korhonen, Nokia's top troubleshooter. 'We encourage bad news to travel fast', said Mr Korhonen. While Philips initially rejected offers of help from Nokia, it soon became apparent that production delays would be much more than one week. Korhonen put together a team to find solutions to supplying the five chips that were affected by the Philips fire. Three were quickly re-sourced from Japanese and American suppliers, but the other two were only supplied by Philips. This time Philips cooperated at the highest level. Nokia's chairman and chief executive, Mr Ollila, met with the Philips CEO Mr Boostra and the head of the Philips semiconductor division, Mr van der Poel. Factories at Eindhoven and at Shanghai were rescheduled to supply the missing chips, and engineers from both Nokia and Philips worked to accelerate the return of the Albuquerque plant to full production. As a result of these intensive efforts, there were relatively minor delays to Nokia's cellphone shipments.

Executives at Ericsson in Sweden only learned of the problem several weeks after the fire. Company culture was less proactive than at its Finnish rival. The bad news was withheld from senior management long after it became clear that delays were becoming serious. By the time that Ericsson realised the magnitude of the problem, it was too late to find alternative sources. Nokia had seized remaining world capacity, and it took nine months for the situation to be rectified. The disruption led to a 3 per cent loss of market share by Ericsson, and contributed in turn to its exit from the phone handset market.

Question

1 What are the key lessons from this case for dealing effectively with disruptions to the supply chain?

(Source: Sheffi, 2005, and Latour, 2001)

The implication of uncertainty for supply chain processes is that they need to be *flexible*. Flexibility is defined as the 'ability to react or transform [supply chain processes] with minimum penalties in time, cost and performance' (Upton, 1995). Flexibility comes in two basic forms (Sawhney, 2006):

- *Proactive*: to create the capability in advance to handle uncertainty – for example, Toyota's counter-measures.
- *Reactive*: to cope with uncertainty in a focal firm's internal or external environment – for example, Nokia's response to the fire at Philips.

Uncertainties, wherever they originate, may affect other supply chain partners. In Chapter 7, we develop the case for managing uncertainty in supply chains under the theme of *agility*.

1.3.3 Soft objectives

There are other ways in which logistics advantage may be gained, but these are not so readily measurable as those listed above. They are referred to as 'soft'

objectives as distinct from the more easily measurable 'hard' objectives. Examples of soft objectives are:

- *confidence*: queries answered promptly, courteously and efficiently;
- *security*: customer's information and property treated in a confidential and secure manner.

Soft objectives need to be measured in different ways to hard objectives, such as customer attitude surveys.

Logistics is not the only way in which product competitiveness in the marketplace can be enhanced. The performance objectives listed above can be added to (and in some cases eclipsed by) other ways in which products may win orders, such as design and marketing features. No matter how good the logistics system might have been, lack of an early 'clam shell' design led to the reduction of Nokia's market share for mobile telephone handsets in Europe. Superior product or service design – often supported by brand image – may become the dominant ways of achieving advantage in the marketplace. Here, the logistics task is to support the superior design. BMW's supply chain is one of the most efficient there is, mainly because its products are sold (at least in Europe) as soon as they have been made. Finished cars do not accumulate in disused airfields across Europe, like those of the mass producers. Finished product storage adds cost, with no value added from an end-customer perspective.

1.3.4 Order winners and qualifiers

The relative importance of the above logistics performance objectives is usually different for a given product or service. A helpful distinction is that between order winners and order qualifiers (Hill, 2000):

- *Order winners* are factors that directly and significantly help products to win orders in the marketplace. Customers regard such factors as key reasons for buying that product or service. If a firm raises its performance on those factors, it will increase its chances of getting more business. Thus a product that competes mainly on price would benefit in the marketplace if productivity improvements enabled further price reductions.
- *Order qualifiers* are factors that are regarded by the market as an 'entry ticket'. Unless the product or service meets basic performance standards, it will not be taken seriously. An example is quality accreditation: a possible supplier to major utilities such as PowerGen in Britain and EDF in France would not be considered seriously without ISO 9000 certification. And delivery reliability is a must for newspapers – yesterday's news is worthless. Note that, in both examples, order qualifiers are *order-losing sensitive*: loss of ISO 9000 accreditation would make it impossible to supply to major utilities, and late delivery of newspapers would miss the market.

The different impacts of the two sets of criteria are illustrated in Figure 1.10. Increased performance in an order winner, shown by the solid line, increases

competitive benefit for the product in proportion. Order qualifiers, shown by the dotted line, have different characteristics. Attainment of a required performance standard, such as ISO 9000 accreditation, gains entry to the market but no more than that.

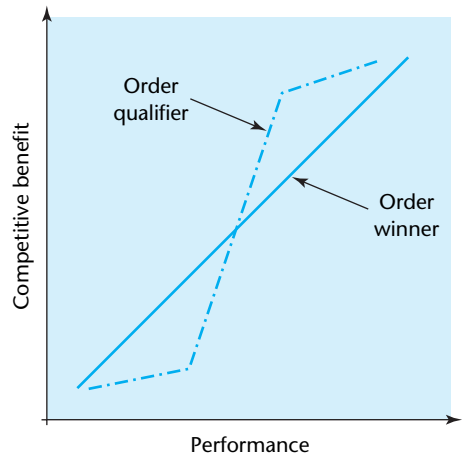


Figure 1.10 Order winners and order qualifiers

Order winners and qualifiers are *specific to individual segments,* a point we develop in the next chapter. Table 1.1 provides an example of how two different products made by the same manufacturer and passing through the same distribution channel have different performance objectives. The first product group comprises standard shirts that are sold in a limited range of 'classic' colours and sizes. The second product group comprises fashion blouses that are designed specially for each season in many colours and a choice of styles with associated designer labels.

Analysis of the order winners and qualifiers shows that the two product ranges have very different performance criteria in the marketplace. Of the two, the range of fashion blouses presents more logistics challenges because demand for individual skus are much more difficult to forecast. It is not until the season is under way that a picture begins to emerge about which colours are selling most in which region of the market. The logistics challenge is therefore concerned with speed of response and flexibility to changing demand. The logistics challenges between the two ranges are quite distinctive.

Not only can order winners and qualifiers be different for different products and services. They can also *change over time*. Thus, in the early phase of a new product life cycle, such as the launch of a new integrated circuit, the order winners are availability and design performance. Price would often be a qualifier: provided the price is not so exorbitant that no one can afford it, there is a market for innovators who want the best-performing chip that is available. But by the maturity phase of the life cycle, competitors have emerged, the next generation is already on the stocks, and the order winners have changed to price and product reliability. The former order winners (availability and design performance) have changed to become order qualifiers. The logistics challenge is to understand the market dynamics and to adjust capabilities accordingly.

Table 1.1 Different product ranges have different logistics performance objectives

	Classic shirts	Fashion blouses
Product range	Narrow: few colours, standard sizes	Wide: many colours, choice of styles, designer labels
Design changes	Occasional	Frequent (at least every season)
Price	Everyday low price	Premium prices
Quality	Consistency, conformance to (basic) spec	High grades of material, high standards of workmanship
Sales volumes	Consistent sales over time	Sales peak for given fashion season
Order winners	Price	Time-to-market Brand/label Quality
Order qualifiers	Quality Availability	Price Availability
Logistics priorities	Cost Dependability Quality	Speed Flexibility Quality

The *actions of competitors* are therefore a further influence on logistics performance objectives. For example, low-price competitors are a feature of most markets, and attempt to differentiate themselves from the perhaps higher-grade but pricier incumbents. Thus competitors like Matalan have sparked fundamental changes in logistics strategy at the long-established UK clothing retailer Marks & Spencer (www.marksandspencer.com). In response to loss of sales to cheaper new entrants, Marks & Spencer ditched long-standing agreements with local UK suppliers and sourced garments from new, lower-priced suppliers in the Far East.

Activity 1.3

Select the top two product lines (in terms of sales) for your firm or one that you know well. Using the headings in Table 1.1, fill in the details for characteristics of both product lines. Aim to use precise details, so identify the actual sales figures instead of putting 'high' or 'low'. Use additional or other headings if they describe the situation better. Go on to identify the principal order winners and qualifiers for each product.

1.4 Logistics strategy

Key issues: **What is 'strategy'? How can competitive criteria be aligned within a supply chain? How can logistics strategies be tuned to different product needs?**

1.4.1 Defining 'strategy'

Strategy is about planning as distinct from doing. It is about formulating a long-term plan for the supply chain, as distinct from solving the day-to-day issues and problems that inevitably occur. Extending the concept of 'strategy' from Hayes and Wheelwright (1984),

> **Logistics strategy is the set of guiding principles, driving forces and ingrained attitudes that help to coordinate goals, plans and policies, and which are reinforced through conscious and subconscious behaviour within and between partners across a network.**

All too often, logistics 'strategy' is set using few such characteristics: decisions are made piecemeal by accident, muddle or inertia. We need, however, to recognise that strategic decisions may indeed be made by such means.

Whittington (2000) proposes four approaches to setting strategy. He starts by suggesting different motivations for setting strategy:

- *How deliberate are the processes of strategy setting?* These can range from clearly and carefully planned to a series of ad hoc decisions taken on a day-to-day basis.
- *What are the goals of strategy setting?* These can range from a focus on maximising profit to allowing other business priorities such as sales growth to be included.

If we make these two considerations the axes of a matrix, Figure 1.11 suggests four options for crafting strategy.

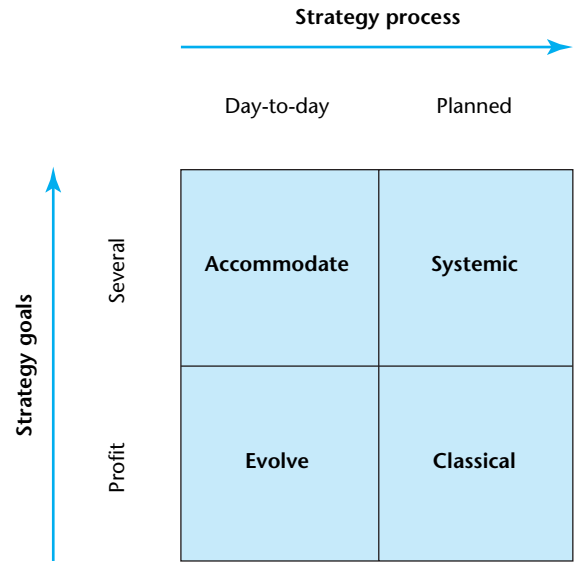


Figure 1.11 **Four options for crafting strategy**

What are the implications for the way in which supply chain strategy is approached in different organisations? Here is a brief description of the four options:

- *Evolve*. 'Strategy' is not something that is formally undertaken at all. 'Our strategy is not to have a strategy' is a typical viewpoint. Operating decisions are taken in relation to the needs of the moment, with financial goals as the main guiding principle.
- *Classical*. While financial goals are again the main guiding principle, these are achieved through a formal planning process. This is called 'classical' because it is the oldest and most influential option.
- *Accommodate*. Here, decisions are back to the day-to-day mode, but financial objectives are no longer the primary concern. Strategy is accommodated instead to the realities of the focal firm and the markets in which it operates.
- *Systemic*. This option for strategy setting sees no conflict between the ends and means of realising business goals. While goal setting takes place across all major aspects of the business (including human resources, marketing and manufacturing policies), these are linked to the means by which they will be achieved in practice.

Logistics strategy usually demands systemic strategy setting between network partners, who may have to coordinate order winners and qualifiers across different market segments.

1.4.2 Aligning strategies

In section 1.1 we showed the supply chain as a network of operating processes. In section 1.2 we emphasised the need to 'integrate' these processes to maximise flow and focus on the end-customer. And in section 1.3 we saw how supply chains can choose to compete on a range of different competitive priorities. Now it is time to put these ideas together and show how strategies need to be *aligned* across the supply chain.

If different links in the supply chain are directed towards different competitive priorities, then the chain will not be able to serve the end-customer as well as a supply chain in which the links are directed towards the same priorities. That is the basic argument for alignment in the supply chain (Cousins, 2005). Where the links are directed by a common and consistent set of competitive criteria, then that supply chain will compete better in the marketplace than one in which the links have different, conflicting priorities. This is the concept of 'focus'.

Focus is based on the view that you cannot be good at everything. For example, it is difficult to handle high volume, low cost products in the same channel to market as low volume, high variety products, for which flexibility is the name of the game. While the assembly line is the method of choice for manufacturing cars in volume, development of prototypes for new models is kept well away from the factory in special facilities until close to launch. This is because the development process demands quite different technical skills and equipment that are better physically separated from the more routine, efficient and repetitive assembly line. In the example of the standard shirts and fashion blouses in section 1.3, the associated operations processes would be kept separate ('focused') for similar reasons. And the separation could be thousands of kilometres. 'Classic'

shirts could be sourced from China, where prices are low, and long delivery lead times are not so important. 'Fashion' shirts may be sourced nearer to home, because response time is key and cost is less important (see Case study 4.2).

What happens when the processes are not aligned within a supply chain? Let us address that question with Case study 1.4 to show the problems that can arise.

CASE STUDY 1.4

Talleres Auto

Talleres Auto (TA) is an SME based in Barcelona. TA attends to broken-down vehicles, providing a roadside repair and recovery service. Two of the parts that TA frequently uses are starters and alternators, which were obtained from a local distributor. In turn, the local distributor ordered parts from a prime distributor. Starters and alternators were obtained from a remanufacturer, who replaced the windings and tested the products using parts bought from a component supplier. A diagram of this part of the supply chain is shown in Figure 1.12.

- Talleres Auto is the installer
- TA buys starters and alternators from a local distributor
- the local distributor buys from a prime distributor
- the prime distributor buys from a remanufacturer
- the remanufacturer buys components from a component supplier

Figure 1.12 The Talleres Auto supply chain

Most of TA's customers made 'distress purchases' – their car had broken down and they wanted it to be fixed quickly. So TA needed a fast replacement service from the local distributor. While the distributors both recognised the need for fast replacements, the performance of the purchasing department at the remanufacturer was measured on cost savings. Thus the component supplier thought that the name of the game was low cost.

(Source: Harland, 1997)

Questions

1 What were the order winners and order qualifiers at TA?

2 What were the order winners and order qualifiers at the component supplier?

3 What impact on customer service was this mismatch likely to cause?

1.4.3 Differentiating strategies

A supply chain, then, may choose to compete on different criteria. Such criteria need in turn to be recognised and form part of the business strategies of all the

members of a given network. The choices so made have major implications for the operation of each member. Failure to recognise competitive criteria and their implications for a given product or service *by any member* means that the supply chain will compete less effectively. It is like playing football when the goalkeeper makes an error and lets in a goal that should not have happened – s/he lets the whole side down.

What makes a successful strategy? Five principles of strategic positioning, related to logistics strategy, are as follows (after Porter, 1984):

- *A unique value proposition*: determining what makes the product/service different from its competitors.
- *A tailored supply chain*: governed by consistent order winning and qualifying criteria.
- *Identify the trade-offs*: by choosing not just the priorities but also what not to do. A responsive supply chain is not compatible with an efficient supply chain (Fisher, 1997).
- *Align logistics processes*: so that processes are mutually reinforcing.
- *Continuity*: logistics processes are continually and consistently improved over time.

To reinforce the issue of differentiating strategies, let us look at two commonly used strategies that have very different logistics implications. Consider products with different logistics priorities, such as those in Table 1.1:

- *Cost*: a high volume product for which demand is relatively stable throughout the year. While subject to occasional enhancements, these are usually small scale: the life cycle is comparatively long. Demand forecasts are usually pretty accurate.
- *Time*: a high variety product, which is designed for a given season and which is completely redesigned for the next season. Often, it is impossible to predict which colour or style will sell best. The product life cycle is short, and demand is much more difficult to forecast.

Cost and time have quite different logistics implications. The very actions that help to reduce costs, such as Far East sourcing, are completely the wrong strategy when speed and responsiveness are top of the agenda. Similarly, investing in high volume, low variety equipment in the factory may create efficiency and low cost, but limit a firm's ability to offer variety and fast response times. Developing the capability to support more of one priority (cost) hobbles the capability to support another (time). This is the principle of *trade-off* in logistics: more of one thing means less of another. Ideally, we want two separate supply chains, one focused on cost, the other on time. This may not be fully practical because of the need to maintain a single European distribution centre. But logistics operations within the DC may well be kept separate to avoid one product line interfering with the flow of the other. The same thinking may also apply *within* a given product range, when everyday ('base') demand may need to be kept separate from promotional ('surge') demand. We return to these concepts in the next chapter.

Activity 1.4

1 Using the concepts from this section, analyse the supply chain support for both of the products you analysed in Activity 1.3. What should the supply chain be *(functional-efficient or innovative-responsive)*? What is the reality, and why are the two different?
2 To what extent is there alignment of strategy in the supply chains for these two products?

Summary

How does logistics work within the supply chain?

- Supply chain management is defined as 'planning and controlling all of the business processes – from end-customer to raw material suppliers – that link together partners in a supply chain in order to serve the needs of the end-customer'.
- Logistics is defined as 'the task of coordinating material flow and information flow across the supply chain'.
- In a supply chain, materials flow from upstream to downstream. Demand information from the end-customer flows in the opposite direction. A focal firm is positioned within a supply 'network', with tier 1 suppliers and tier 1 customers its immediate neighbours. Material flow measures the quantity of material that passes through a given network per unit of time.
- A supply network is a system in which each organisation is linked to the others. Therefore the overall performance of the network results from the combined performance of the individual partners.
- Logistics supports competitiveness of the supply chain as a whole by meeting end-customer demand through supplying what is needed when it is needed at low cost.

What are the performance objectives of the supply chain, and how does logistics support those objectives?

- 'Hard objectives' are quality, speed and cost because they are easy to measure and relatively obvious to the end-customer. Briefly, quality is about doing things right, speed is about doing things fast, and cost is about doing things cheaply. Supporting capabilities are concerned with controlling variability (the dependability advantage), and dealing with uncertainty (the rapid response advantage). Uncertainty can be addressed by flexibility in logistics processes – either proactively or reactively. 'Soft objectives' are service-oriented, such as security and confidence. They are less easily measurable than hard objectives.
- Such performance objectives can, and often are, augmented by other objectives that are outside logistics. These include product superiority, innovation and brand. Here the logistics task is to support such performance objectives in the marketplace.
- The relative importance of logistics performance objectives varies from one situation to another. It can also vary over time. The concept of order winners

and qualifiers helps to prioritise the logistics task. Key influences on relative importance are individual product needs in the marketplace, position in the product life cycle, and competitor activity.

- Logistics strategy is the set of guiding principles, driving forces and ingrained attitudes that help to communicate goals, plans and policies, and which are reinforced through conscious and subconscious behaviour within and between partners across a network.

Discussion questions

1 Bill Gates of Microsoft describes the 2000s as 'business @ the speed of thought'. Discuss the importance of speed in the supply chain. How can speed be increased within the supply chain?

2 Suggest logistics performance priorities for the following, explaining why you have come to your conclusions:
- **a** a low fare airline such as Ryanair;
- **b** a fast food chain such as McDonald's;
- **c** an overnight parcels service such as TNT.

3 What is meant by the term *alignment* in relation to supply chain processes? Why is alignment important in setting a strategy for a given supply chain?

4 What does *flow* mean in a supply chain context? Explain how material flow relates to information flow in a supply network.

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Suggested further reading

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