

CHAPTER 14

Lean and Value-adding Supply Chains

Learning objectives and indicative content

- 5.2 Evaluate the concept of lean supply as a means of achieving competitive advantage.
- The concept of lean
 - The seven types of waste
 - Critique of the lean approach (New and Ramsay 1997)
 - Alternatives to lean (agility) and hybrid approaches (leagility)
- 5.3 Critically evaluate the concepts of value, added value and value chain.
- Concepts of value and added value
 - The value chain concept
 - Porter's (1985) value chain model
 - Critiques of Porter's model (Hines 1993)
 - Strategies for adding value: repositioning on the value chain, value constellations

Chapter headings

- 1 Value and added value
- 2 The value chain
- 3 Value-adding strategies
- 4 Lean supply
- 5 Agile supply

Introduction

In this chapter we look at a number of modern concepts: lean supply, agile supply, added value. The benefits of these concepts have been widely advocated in the literature, but researchers have also identified a number of shortcomings. We look at the various ideas in turn with a critical eye.

1 Value and added value

Competitive advantage

- 1.1 Michael Porter argued that competitive advantage comes from the value a company creates for its customers. Value is the 'worth' of the product or service: what it costs the organisation to produce and what the customer is willing to pay for it. In other words:
- A firm creates value – by performing its activities better, differently or more efficiently than its competitors.
 - Customers purchase value – measured by comparing a firm's products and services with those of its competitors.
- 1.2 The term 'added value' refers to a product being given greater value or worth as a result of all the processes that support the product. Customer service is an obvious example, but it is possible to see the concept of adding value from a number of different perspectives.

Perspectives on added value

- 1.3 According to Porter, the ultimate value a firm creates is measured by the amount customers are willing to pay for its products or services *above* the cost to the firm of carrying out all its value-creating activities (production, service, logistics, marketing and so on). A firm is profitable if the realised value to customers (what they are prepared to pay) exceeds the collective cost of the firm's value-creating activities.
- 1.4 From an accounting perspective, therefore, added value is total revenue minus total costs of all activities undertaken to develop and market a product or service. This expresses the amount of economic value that has been added to the organisation's resources: how efficiently they are being used and how effectively they are being leveraged. From this perspective, you can add value *either* by inducing customers to pay more *or* by reducing production costs. Seen from the customer's perspective, it means selling an equivalent product at lower prices (while maintaining viable profit margins), or providing additional product features or services to attract a premium price.
- 1.5 From a marketing point of view, added value resides in defining a product as a bundle of benefits that offer customers value (Kotler and Armstrong).
- The core product represents the key benefits received directly from purchasing the product: in the case of a car, transport.
 - The actual product is the key elements of the product which differentiate one product from another. This may include brand name, packaging, features, quality and so on: in the case of a car, the model, design and performance, say.
 - The augmented product, however, may include a range of tangible and intangible elements which add value (and often differentiate competing products). This may include: optional extras, warranties, delivery and credit facilities, after-sales service, installation, the esteem/prestige value of ownership – and the total 'customer experience'.

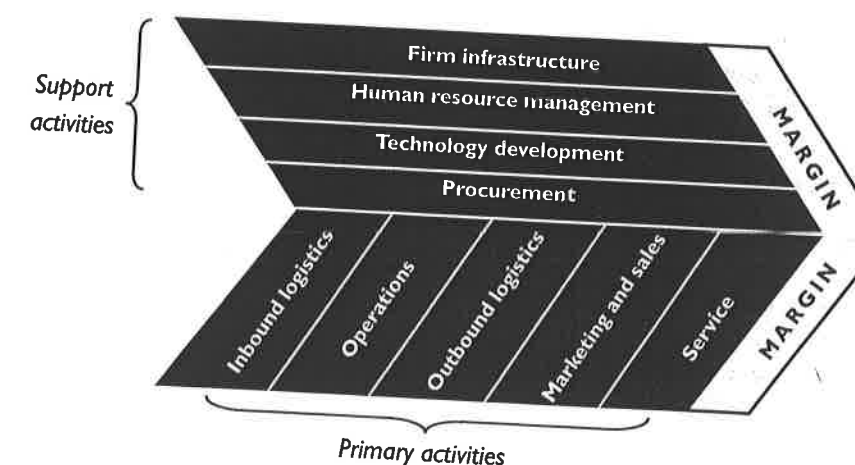
- 1.6 Value can thus be added by offering enhanced features, quality, brand image (customer perception), exclusivity, delivery/availability, service levels and so on – as well as value for money. Porter and others have emphasised that value is effectively 'in the eye of the customer', and organisations must seek to understand exactly what aspects of their offering customers will place value on.
- 1.7 Value addition can also, however, be achieved through cost reduction or process efficiency. One of the most effective ways is to reduce the order cycle time by getting the goods to the market faster: this could be achieved by developing a well-managed and controlled supply chain that minimises waste and costs. (We will discuss 'lean supply', in this context, later in the chapter.)

2 The value chain

Porter's value chain model

- 2.1 The value chain is the sequence of business activities by which value is added to the products or services produced by an organisation or supply chain. It embraces the entire process from raw materials to finished delivered product and continuing after-sales service.
- 2.2 The value chain concept may be used to identify and understand specific potential sources of a firm's (or supply chain's) competitive advantage. The value chain separates out the strategically important activities of the business, in order to gain fuller understanding of the value of each.
- 2.3 Porter's value chain model maps total value as a combination of the value added by the activities of a business unit: Figure 14.1. (Note that these are not the same as business functions: they may be carried out across departments.)

Figure 14.1 Porter's value chain



- 2.4 Primary value activities are grouped into five areas.

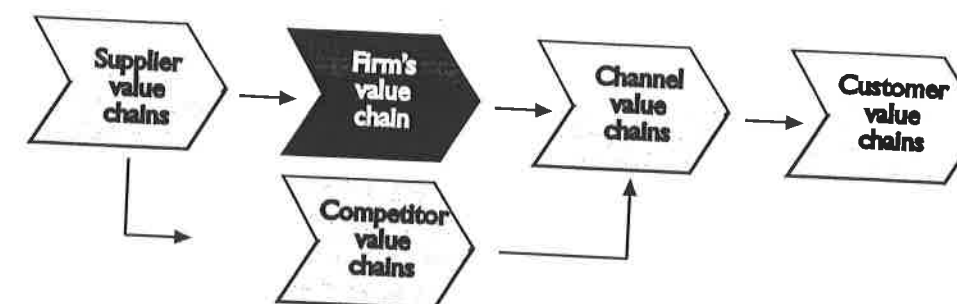
- Inbound logistics are the activities concerned with receiving, storing and disseminating inputs: materials handling, warehousing, inventory control etc.
- Operations are concerned with the transformation of inputs into finished goods or services. In manufacturing, these activities include assembly, testing, packing and equipment maintenance; in service industries, basic service provision.

- Outbound logistics are concerned with storing, distributing and delivering the finished goods to customers: warehousing, materials handling, transport planning, order processing and so on.
 - Marketing and sales are responsible for communication with the customers to provide a means by which they can purchase the product (as well as an inducement to do so): market research, new product development, advertising and promotion, sales force management, channel management, pricing and so on.
 - Service covers all of the activities which occur after the point of sale to enhance or maintain the value of the product for the customer: installation, repair, training, parts supply and maintenance.
- 2.5 The secondary, or support, activities operate across the primary activities, as in the case of procurement where at each stage items are acquired to aid the primary functions.
- Firm infrastructure refers to systems and assets for planning, finance, quality control and management.
 - Human resources are all the activities involved in recruiting, deploying, retaining and developing people in the organisation.
 - Technology development activities relate to both equipment, systems and methods of work organisation: product design and improvement of production processes and resource utilisation.
 - Procurement is – as you know – all activities to acquire inputs for primary activities.
- 2.6 The key points of the model can be summarised as follows.
- 'Each activity within a value chain provides inputs which, after processing, constitute added value to the output received by the ultimate customer in the form of a product or service or as the aggregate of values at the end of the value chain.' (Lysons and Farrington)
 - Activities within the value chain are interdependent: each element can affect the costs or effectiveness of another in the value chain, forming what Porter called linkages. These require co-ordination in order to optimise the flow of value. So, for example, improvement of product design or quality management might reduce the need for after-sales service. On-time delivery requires integration of procurement, operations, outbound logistics and service activities.

The value system or value network

- 2.7 The individual firm's value chain does not exist in isolation, and – as we have seen in our discussion of supply chain management – value-adding activities do not stop at the organisation's boundaries. A firm can secure competitive advantage by managing the linkages within its supply network: eg by operating just in time supply or total quality management. This wider value chain, extended through the supply chain, is known as a value system or value network: Figure 14.2.

Figure 14.2 The value system



Critique of the value chain concept

- 2.8 According to Porter, the value chain offers a tool that 'disaggregates a firm into its strategically relevant activities in order to understand the behaviour and costs and the existing and potential sources of differentiation'. In other words, it helps managers to identify potential sources of competitive advantage and to highlight internal activities that add value (and/or cost). It also highlights the need to co-ordinate activities effectively: within the wider value system, this may support better outsourcing decisions and supplier management.
- 2.9 In an influential critique, Hines recognises two key contributions of the value chain/system model. Firstly, it highlights the role of an integrated materials management or logistics perspective as a value adding mechanism. This has contributed to the increasing status and strategic role of supply chain management in organisations. Secondly, it reinstates the customer as the focal point of the supply chain and the ultimate measure of value.
- 2.10 However, Hines also identifies several key problems with Porter's model.
- Despite its customer perspective, the model still focuses on profitability as the primary objective, and defines value creation as the profit margin of each firm – rather than a whole-chain focus on consumer satisfaction.
 - Despite its recognition of the importance of linkages, the model is not highly integrative: it shows interfaces between separate activities and value chains, rather than integration.
 - The distinction between primary and support functions is somewhat arbitrary, and misrepresents the relative importance of some functions.
 - It is a static model, based solely on American firms: it fails to take into account more innovative values (eg in Japanese firms), modern information technologies (enabling the creation of 'virtual' value chains) and the competitive challenges of dynamic markets.
- 2.11 The alternative version of the value chain put forward by Hines is an **integrated materials value pipeline**.
- The value chain runs from right to left, emphasising the consumer as key driver of value. The primary objective is consumer satisfaction, rather than profitability: the process is a 'pull' (demand-driven) rather than a 'push' (supply-driven) system.
 - Rather than a series of linked chains, there is one holistic flow from consumer to raw material source. Similarly, the primary activities are no longer separated, but integrated: internal vertical barriers and external adversarial relations are broken down.

- The primary activities comprise teams concerned with marketing, materials, engineering, quality, R & D and design.
 - The secondary activities are identified as: activity based costing (to enable the exact cost of products and the benefits of activities to be ascertained); human resources management (especially employee development for flexibility and creativity); total quality management (as a driver of network culture); electronic data interchange (to facilitate integration and efficient consumer response) and profit (viewed from the perspective of the entire value chain, and shared equitably between network members).
- 2.12 Hines also proposed a 'macro' partnership model, which we will discuss under the heading of network sourcing in Chapter 16.

3 Value-adding strategies

How is value added?

- 3.1 As we have suggested, in broad terms, value can be added by 'performing... strategically significant activities better, differently or more cheaply': Porter's generic strategies of differentiation, focus and cost leadership.
- 3.2 *Johnson, Scholes and Whittington* identify the following key questions that need to be addressed in relation to the wider value system or network.
- Where cost and value are created
 - Which activities are centrally important to the organisation's own strategic capability, and which are less central. This will influence its decisions about which activities it needs to retain direct control over, and which can be outsourced to lower cost producers.
 - Where the 'profit pools' are: the potential profits at different parts of the value network. Strategy can then focus on areas of greatest profit potential.
 - Make/do or buy (outsourcing) decisions. ('Of course, the more an organisation outsources, the more its ability to influence the performance of other organisations in the value network may become a critically important competence in itself, and even a source of competitive advantage.')
 - Who might be the best partners in the various parts of the value network, and what kinds of relationships will best leverage their potential?
- 3.3 Another strategic issue will be the inevitable trade-offs at linkage points in the value chain. Holding high levels of finished goods might ease production scheduling problems and give a faster customer response time, for example, but will probably add to the overall cost of operations. An assessment as to whether the added value of high stocks is greater than the added cost needs to be made.
- 3.4 One of the most important aspect of adding value along the supply chain is concerned with eliminating waste, and this also has an impact on supply chain relationships – as we will see in the following section on lean supply.
- 3.5 *Emmett* offers some pithy advice for adding value: 'make it faster, move it faster, get paid faster'.

Adding value through knowledge management

- 3.6 Supply chain strategy must select a winning value proposition and then align all other functional interfaces, staff and suppliers to delivering it profitably. Given that this alignment process is complex, there has been a growing recognition that the knowledge and capabilities of people in the supply chain are an important source of added value.
- 3.7 It has been argued that future profitability for many firms will come from intellectual capital rather than through production processes. Companies have to acknowledge that they use only a small percentage of the expertise that exists internally and across their supply chains. Appropriate strategies are required in order to measure, create, deploy, retain and protect that knowledge and expertise. In recent times, as we have seen, the flow of knowledge has been supported by a trend towards joint ventures, strategic alliances and collaborative agreements between companies.

Adding value through supply chain positioning

- 3.8 The concept of value added sequentially at each stage or link in a value chain suggests a number of positioning strategies. The concept of key value activities raises the issue of how far up or down the supply chain the organisation wishes to retain direct control over those activities; to ensure their effectiveness; to ensure co-ordination and integration across organisational boundaries; and to appropriate a larger share of the resulting value gains (profits).
- 3.9 The organisation may also want to position or reposition itself at the stage of the value chain where the greatest profit potential is. *Johnson, Scholes and Whittington* use the example of car manufacturers seeking to reposition themselves downstream in the more profitable areas of car hire and financing (although they found they did not have the relevant competencies to succeed in those sectors).
- 3.10 An alternative strategy, as we have seen, is to attempt to reap the benefits of increased control, complementary competencies and enhanced profitability without the cost and risk of vertical integration. *Normann and Ramirez* introduce the concept of '**value constellations**': clusters of supply chain organisations which collaborate to add value.
- 3.11 The value constellation concept argues that organisations cannot maximise customer value on their own, and that networks offer a more flexible collaborative model than linear supply chain relationships. A key source of competitive advantage, therefore, is the ability to envision and develop holistic value-adding networks.
- 3.12 Networks are better able not only to add value, but to support and mobilise consumers in creating value for themselves: effectively 'outsourcing' aspects of the supply chain to the consumer. Examples include enabling passengers to book flights and entertainments online, for example, or to manage their own financial service transactions (online or via ATMs), or to pick up products direct from warehouses/showrooms/catalogues – sometimes even for self-assembly! As the example of ATMs has shown, however, customers can be cynical about the advantage of paying for the privilege of serving themselves: suppliers need to remember that consumer perception is a key measure of value...

4 Lean supply

Lean thinking

- 4.1 Lean thinking has its origins in Japanese production operations.

Lean production is 'lean' because it uses less of every thing compared with mass production: half the human effort in the factory, half the factory space, half the investment in tools, half the engineering hours to develop a new product in half the time. Also, it requires far less than half of the needed inventory on site. The expected results are fewer defects, while producing a greater and ever growing variety of products. (Krafcik)

- 4.2 Lean thinking can, however, be applied to any organisational type (including services) and can be applied across all areas of the business. It is a three-pronged approach that incorporates a belief in quality, waste elimination and employee involvement supported by a structured management system.

- 4.3 According to the CIPS paper *Lean and Agile Purchasing and Supply Management*, there are five key principles to lean thinking.

- Specify what creates value as seen from the customer's perspective: this implies a need for close relations with the customer to ensure that its perception of value is embodied in what the supplier is offering.
- Identify all steps across the value stream: the aim is to eliminate non-value-adding activities and processes, leaving just a stream of value-adding activities.
- Make those actions that create that value flow: link value-adding activities effectively to deliver total value to the end customer.
- Only make what is pulled by the customer just in time. Traditional production and supply models often lead to production in advance of customer requirements: this is minimised by lean thinking.
- Strive for perfection by continually removing successive layers of waste: activities that add cost (or consume resources) but are not operationally necessary and do not add value.

- 4.4 Lean production organisations also exhibit certain structural and cultural features (Jones), including: decentralisation of tasks and responsibilities (as far as possible) to those who are actually adding value on the production line; horizontal organisation based on cross-functional teams; comprehensive integrated information systems to enable flexible response; and a strong sense of mutual loyalty between employees and the organisation.

- 4.5 Other cultural characteristics of lean organisations have been identified, including: positive, clear communications; 'no blame' culture (to encourage initiative); a high degree of staff involvement; the use of process maps to attract challenge and ideas (in order to remove non-value added steps); an orientation to fixing root causes, not symptoms; and a philosophy of continuous improvement.

The seven wastes

- 4.6 Lean thinking develops the concept of the 'seven wastes' pioneered by one of the early quality gurus, Taiichi Ohno at Toyota. He identified seven areas that could be targeted in manufacturing operations in order to achieve lean supply: Table 14.1. (You should be able to see how the removal of non-value adding activities could equally well be applied to service provision.)

Table 14.1 Taiichi Ohno's seven wastes

Waste caused by ...	Comments
Over-production	Producing output which customers are not yet demanding leads to stockholding costs, product deterioration/obsolescence and scrap. This refers both to finished goods for external customers, and to work in progress for the next stage in the production process. One solution is to use 'pull' systems (such as kanban) to trigger production according to demand.
Transportation	Moving materials between different locations adds cost, and risks damage and deterioration. This may refer to moving materials from their source to our production facility, or to moving materials within the production facility. Either way, effective materials handling, transport and load planning can minimise movements.
Waiting	Delays or queues in processing mean that more time is taken than is really needed, without adding value. Waiting time may be minimised, or used for value-adding activity (such as training or maintenance).
Motion	Unnecessary motions (bending, reaching and so on) violate sound ergonomic principles. This can reduce productivity and cause fatigue (and possibly injury) to staff.
Over-processing	This can happen when unnecessarily sophisticated equipment is used to produce relatively simple goods, adding to their cost. It may also create inefficient facilities layouts and materials handling. Value analysis (and value engineering for new product design) is often used to remove non-value adding features and processes.
Inventory	Lean supply aims to eliminate the use of buffer stocks. Stockholding incurs cost without adding value, and can mask inefficiencies in production planning or processes. Just in time (JIT) systems are used to 'pull' inventory through the system in response to demand.
Defects/corrections	The costs of rework and scrap do not add value, but reduce bottom-line profit. Defects are regarded as opportunities for problem-solving and improvement, often using a <i>kaizen</i> or continuous improvement approach.

Lean supply

- 4.7 The search for lean performance soon spread beyond its origins in manufacturing. Service companies realised that the new model was in many respects just as applicable to their markets. Within organisations, individual functions began to seek ways of becoming leaner. In particular, the idea gained ground that eliminating waste in purchasing activities, and avoiding duplication of effort throughout the supply chain, could bring important cost and quality benefits. The concept of lean supply was born.
- 4.8 Lamming defines lean supply as: 'the elimination of duplication of effort and capability in the supply chain, combined with a philosophy of continuously increasing the expectations of performance and self-imposed pressure to excel.' He goes on to argue that: 'This is achieved by recognition of mutual dependence and common interest between customer and supplier – beyond the principle of operational collaboration'.

- 4.9 Lamming put forward a model of customer-supplier relationships that illustrates the characteristics of lean supply: Table 14.2.

Table 14.2 Customer-supplier relationships in lean supply

Factor	Lean supply characteristics
Nature of competition	Global operation, local presence Based upon contribution to product technology Dependent upon alliances/collaboration
The basis of sourcing decisions	Early involvement of established suppliers Joint efforts in target costing and value analysis Single and dual sourcing Suppliers providing global benefits Re-sourcing as a last resort, after attempts to improve
Exchange of information between supplier and customer	True transparency (eg on costs etc) Two-way discussion of costs and volumes Exchange of technical and commercial information Electronic data interchange
Management of capacity	Kanban system signalling demand in real time Regional strategic investments discussed Synchronised capacity Flexibility to operate with fluctuations
Delivery practice	True just in time (JIT) Local, long-distance and international JIT
Dealing with price changes	Price reductions based on cost reduction from order onwards: joint efforts of supplier and customer
Attitude to quality	Supplier vetting schemes become redundant Mutual agreement on quality targets Continual interaction and improvement (kaizen) Perfect quality as a goal

Collaboration on cost reduction

- 4.10 An increase in the proportion of external spending by manufacturers means that many such companies can be described as 'low value added' firms. In other words, the price paid by the eventual consumer is largely made up of costs charged by suppliers to the manufacturer: the manufacturer himself adds relatively little value.
- 4.11 The implication of this is clear. To achieve competitive prices, such companies must focus on their costs, which increasingly arise outside the boundaries of the firm. Purchasing's contribution in reducing costs right along the supply chain, while maintaining and improving quality, is vital.
- 4.12 One technique that is relevant here is **target costing**.
- The traditional model of product pricing starts by analysing the total cost of a product. A profit margin is then added to determine a selling price – which may or may not correspond to what the market is willing to pay.
 - Target costing starts at the other end, with an estimate of the selling price that the market will be willing to pay for a product with specific features. The members of the supply chain can then work backward to calculate the costs that must be achieved in order to provide a reasonable profit.

- 4.13 Target costing is hardly feasible without close cooperation between members of the supply chain. Each member must work closely with the others to identify opportunities for cost reductions and progressively seek to drive costs and prices downwards.
- 4.14 This will require a measure of trust, reflected in **open book costing**: suppliers should be ready to talk frankly with customers about their cost structures. This has several advantages: it facilitates cost-based pricing; enables the buyer to get to know the supplier's operations and processes (for closer collaboration); enables joint identification of areas for cost reduction and added value; and reassures buyers that they are receiving value for money (non-exploitative profit margins).
- 4.15 An even more radical approach is **cost transparency**, where there is two-way sharing of cost information on activities in which buyer and supplier have a common interest. This is more suited to a strategic partnership relationship (and even then, with appropriate confidentiality protection).

A critique of lean supply

- 4.16 The benefits claimed for lean supply include:
- The progressive removal of wastes, reducing costs and improving quality
 - Closer collaborative relationships within the supply chain, creating opportunities for shared competitive advantage and synergies
 - Cross-functional teamworking, involvement and flexibility within the organisation (with flow-on benefits for organisational learning and continuous improvement)
 - Reduced inventories (also improving cashflow)
 - Shorter cycle/delivery times, enabling better service to consumers
 - More efficient process flows, allowing better resource utilisation
 - Fewer defects, creating customer loyalty and lower failure costs.
- 4.17 Lean supply chains do, however, have their limitations – and are not suitable for all organisations in all circumstances.
- The reduction of wastes can reduce capability to respond flexibly to contingencies, eg by removing buffer stocks that would minimise vulnerability to emergency orders or supplier failure.
 - Highly integrated, downsized supply chains can increase supply risk (eg in the case of supplier failure: a recent classic example is the case of British Airways, whose UK operations were immobilised in 2005 by industrial action at Gateway Gourmet, to whom BA had outsourced all its in-flight catering.) It can also prevent the organisation from exploiting opportunities presented by global supply and e-business through short-term virtual (ICT-integrated) relationships.
 - There may be a narrow focus on reducing cost (or on shop-floor technologies and techniques) rather than enhancing quality, service and creativity, for long-term customer value.
 - Less powerful members of the supply chain may incur heavy costs becoming lean, and make themselves vulnerable through open book costing, without sharing equitably in the value gains.
 - Lean supply primarily suits high-volume industries with long lead times and relatively predictable demand: it is less effective in low-volume, dynamic industries.

4.18 New and Ramsay also put forward an influential critique of lean supply. From the business point of view, excessive leanness can create rigidity, with insufficient slack in the system to take account of fluctuations in demand and disruptions to supply. The costs of becoming lean may discourage small suppliers from participating in the supply chain, causing buyers to lose out on potentially optimal suppliers.

4.19 New and Ramsay also identify a number of detrimental effects of lean supply for consumers and wider stakeholder groups.

- Lean chains focus on small supplier bases and partnerships with preferred suppliers. While this benefits the organisations concerned, it reduces competition: creating barriers to entry, allowing complacency, increasing margins and generally eroding the level of efficiency in the market. Unless there is a strong consumer value focus, consumers may eventually lose out.
- Lean thinking may lead to rationalisation within industries, reducing overall manufacturing capacity and causing job losses, with potentially significant social and economic costs in affected areas.
- Lean chains allow producers to satisfy customer demand swiftly. This may have undesirable effects such as increasing the overall level of consumption (with social and environmental costs) and overproducing swiftly-obsolete, disposable goods (again with potential environmental impacts).

4.20 We will now look at alternatives to lean supply.

5 Agile supply

The meaning of agile supply

- 5.1 The concept of agility is an acknowledgement that we operate in an ever-changing world with constantly changing demands. Agility implies proficiency at dealing adequately with change or unexpected events – such as recovering from supplier failure. Unplanned events in the supply chain could be caused by staff shortages, breakdowns, delayed deliveries or a need to expedite an order to a customer who has an urgent requirement for supply.
- 5.2 The CIPS paper on lean and agile supply describes agile supply as 'using market knowledge and a responsive supply network to exploit profitable opportunities in the marketplace'. An agile organisation, for example, is better able to exploit opportunities for product modification at any time that the market appears ready for it.
- 5.3 Christopher supports the view that agility resides in the supply chain: 'the key to agile response is the presence of agile partners upstream and downstream of the focal firm'. Achieving agility requires:
- Streamlining the physical flow of parts from suppliers (eg through process alignment and shared systems, or partnering with suppliers to reduce inbound lead times)
 - Streamlining and synchronising the flow of information (eg through electronic data interchange, integrated information systems and ICT support for virtual collaboration between physically dispersed teams and the rapid formation of supply chain partnerships).

- Adaptability in responding to changing needs of the market (eg through concurrent planning and process redesign; rapid development and trialling of new processes; the use of e-commerce to improve direct contact with customers; and postponing the final configuration, assembly and distribution of products).
- Measuring the performance of the supply chain using suitable agility metrics.

Agile v lean supply

5.4 Rushton, Oxley and Croucher give two simple dictionary definitions to explain the difference between 'lean' and 'agile'.

- **Lean:** having no surplus flesh or bulk
- **Agile:** quick in movement, nimble.

Cox (cited in the CIPS paper) argues that lean philosophy is most powerful when the winning criteria are cost and quality, whereas agility is paramount where service and customer value enhancement are key.

5.5 Whereas lean thinking attempts to remove stock from the supply chain, as being a source of waste, agile thinking is more ready to accept stock, provided the reasons for holding it are sound. For example, the CIPS paper cites the example of a supplier who was asked by its customers to hold stock to enable response on very short lead times: this is an example where stock is not a source of cost, but of value enhancement for the customer. Stock is also accepted by agile companies who practise late customisation: typically, the stocks held will mostly be in the form of work in progress, waiting to be converted into finished goods in response to customer orders.

5.6 Another distinction between lean and agile is based on how manufacturing companies supply their customers.

- Lean manufacturing aims to produce goods only when 'pulled' by a customer (just in time) and to the standard of quality required by the customer.
- Agile manufacturing goes one step further, by means of 'late customisation'. This is familiar to anyone who has ordered a computer from the Dell website: Dell allows the online customer to specify exactly what components are required in the computer system and then manufactures it exactly to the customer specification. This can be done very rapidly, because all of the component parts are finished to a high degree and ready for incorporation in the finished product.

5.7 Some of the main differences can be summarised as follows: Table 14.3 (adapted from Lysons and Farrington).

Table 14.3 Agile v lean supply

Dimension	Agile supply	Lean supply
Focus	Rapid response to unpredictable demand (to minimise stockouts and obsolete inventory)	Meeting predictable demand efficiently (at lowest possible cost) Eliminating waste from the supply chain
Most powerful when:	Service and customer value enhancement are key	Cost and quality are key
Inventory strategy	Deployment of buffer or work-in-progress stock to meet demand	Minimal inventory, high stock turn
Capacity management	Late-customisation	Pull systems (eg JIT)
Lead time strategy	Invest aggressively in resources for shortest possible lead times	Shorten lead time where compatible with cost reduction
Supplier selection	Based on speed, flexibility plus quality	Based on cost, quality
Supplier relationships	Fluid ICT-integrated (virtual) network: rapid/short-term partnership to seize opportunities	Long-term partnerships with downsized supply base
Work organisation	Self-management, entrepreneurship, flexible response	Standardisation for efficiency
Performance measures	Customer-facing metrics (eg on-time-in-full deliveries)	World class measures (eg quality, productivity)

Hybrid lean-agile systems (leagility)

- 5.8 It is possible to combine the benefits of lean and agile in a hybrid system, where lean principles can be applied up to a certain point – but where fluctuating demand and the need for customisation require agile responses at a later stage of the manufacturing process. This is the role of late customisation, for example.
- 5.9 The business processes are separated (or ‘decoupled’) at a particular point: in this case, the point in the supply chain where the customer order penetrates the system. Processes upstream of this point (the manufacture, storage and marketing of modular products, subassemblies or components) are planned on lean principles, to maximise operational efficiency. Processes downstream of this point (configuration, assembly and supply of finished products to customer specification) are planned on agile principles, for swift and flexible responsiveness to customer requirements.
- 5.10 A key challenge of such hybrid systems is forecasting and demand management, in order to keep the upstream process genuinely lean (not overproducing stock of components/subassemblies) and to keep the downstream process genuinely flexible (producing sufficient stock of components/subassemblies to enable swift customisation and delivery).

- 5.11 The example of Dell Computers (referred to in paragraph 5.6, and the thinly-veiled subject of the November 2007 case study) illustrates an ideal candidate for late customisation, with modularised hardware and software products that can be produced and stored in generic form and simply configured to customer specification late in the assembly process. Dell also illustrates the use of marketing interventions in demand management: by offering time-limited, discounted special offers, the company can steer customers towards particular modules already in the production system – thus smoothing out demand fluctuations.
- 5.12 It would be well worth checking out the Dell website (<http://www.dell.com>) to see how this works.

Chapter summary

- Porter takes an accounting perspective in his study of value: added value is total revenue minus total costs. An alternative (marketing) perspective regards added value as residing in a bundle of product features: the core product, the actual product, and the augmented product.
- The value chain is the sequence of business activities by which value is added to products or services. Porter distinguishes between primary value activities and support activities.
- Value adding activities do not stop at an organisation's boundaries. A firm can secure competitive advantage by managing the linkages within its supply network.
- Hines identifies a number of problems with Porter's model: for example, it focuses more on profitability than on customer satisfaction.
- Some have argued that in future profitability for many firms will come more from intellectual capital than from production processes.
- Rather than pursuing vertical integration, a firm may form part of a ‘value constellation’.
- Lean supply is based on producing the same outputs from reduced inputs: less labour, less machinery, less factory space etc.
- Ohno developed the concept of seven wastes: over-production, transportation, waiting, motion, over-processing, inventory, and defects/corrections.
- Financial techniques associated with lean supply include target costing, open book costing and cost transparency.
- Agile supply is based on ‘using market knowledge and a responsive supply network to exploit profitable opportunities in the marketplace’. It is often associated with ‘late customisation’.

Self-test questions

Numbers in brackets refer to the paragraphs where you can check your answers.

- 1 Distinguish between the core product, the actual product and the augmented product. (1.5)
- 2 What are the five primary activities in Porter's value chain? (2.4)
- 3 List the problems of Porter's value chain model identified by Hines. (2.10)
- 4 What is a 'value constellation'? (3.11)
- 5 According to CIPS, what are the five key principles to lean thinking? (4.3)
- 6 List the seven wastes identified by Ohno. (4.6)
- 7 Describe Lamming's model of customer-supplier relationships in a lean supply environment. (4.9)
- 8 Describe the technique of target costing. (4.12)
- 9 List limitations of the lean supply model. (4.17)
- 10 Inventory is more likely to be tolerated in a lean environment than in an agile environment. True or false? (5.5)
- 11 What is 'late customisation'? (5.6)

Further reading

Most of your recommended reading list goes no further than we've already done here. If you have extra time, it may be worth browsing the index of Johnson and Scholes for their coverage of value (in a range of contexts). Christopher also contains some more detailed material on agile supply.