

# Instructor's Manual

## Logistics Management and Strategy

**Competing through the supply chain**

**Fifth edition**

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For password-protected online resources tailored to support the use of this textbook in teaching, please visit [www.pearsoned.co.uk/harrison](http://www.pearsoned.co.uk/harrison)



# Introduction

## Teaching with this book

This textbook has been designed with the MSc in Logistics core course and Supply Chain Management or Logistics MBA options in mind. The aim has been to develop the subject as a broad range of topics that are linked together as a coherent theme. We have therefore not attempted to delve into specific areas such as forecasting in depth. This gives you licence to develop your own favourites while providing a coherent context and thread for your course. Our standpoint has been one of end-customer focus and process alignment across the supply network.

As we state in the preface to the textbook, development of logistics as a discipline has depended on progress along two fronts:

- *Logistics is cross-functional*: within the focal firm, logistics is a *business process*. It cuts across functional boundaries yet has a contribution from each.
- *Logistics is integrative*: between organisations linked within a given supply network, the role of logistics is to integrate information flow with material flow. The *systems nature* of logistics is still proving to be a challenging characteristic to master.

We have set out to give a clear idea of the expanding role of logistics in business today, and to emphasise its integrative needs – both internally (business process redesign) and externally (business network redesign). The section ‘How to use this book’ in the main textbook explains how the structure was conceived:

- Part one positions logistics in terms of what it is, its contribution to competitive strategy, putting the end-customer first and the creation of value.
- Part two focuses on leveraging logistics operations within the overall context of responding to end-customer needs and performance objectives.
- Part three develops the theme of working together across the supply network
- Part four pulls together elements of leading edge thinking in logistics by developing the future challenges and opportunities.

## Discussion and case studies

We have designed this textbook to have plenty of discussion material in each chapter. This material has been designed to help both student and lecturer bring the issues to life in 'real world' settings. Each chapter contains:

- *Two or more short case studies*: with their own study questions. You can ask the class to prepare these in advance individually or in groups. Encourage students to find out more about the organisations that are specified from web sites, journals like *SCM – an International Journal* and papers like the *Financial Times*. Summaries of the points that can be made in response to the study questions are included as separate sections for each chapter in this Manual.
- *Activities*: are intended for groups of students to prepare out of class, and could be the basis of marked assignments. They could alternatively be given to groups to prepare on a rotating basis for presentation in class.
- *Discussion questions*: there are several discussion questions at the end of each chapter which can be used to summarise key learning points at the end of a session. Students could be asked to prepare answers to them ready for the next session. This will help you to 'summarise the situation so far', and to link sessions with the overall course game plan.

## Using the teaching notes for each chapter

The teaching notes for each chapter have been divided into:

- *Teaching Tips*: to help you plan the session by highlighting the key points to be brought out.
- *Teaching Objectives*: to identify the key teaching objectives for the session.
- *Discussion Points*: to suggest how the teaching objectives can be illustrated using chapter case studies, discussion questions and other sources.
- *Slides*: PowerPoint slides from the text to help you prepare your session. These are numbered as in the textbook – for both figures and tables. Additional slides, where used, are numbered consecutively after those used in the textbook.

We continue to make the link with managing supply chains explicit in the subtitle of the book. While SCM remains the ultimate goal, logistics management and strategy provides the route to achieving it. The logistics task is to coordinate material flow and information flow across the supply chain to meet end-customer needs (book, page 7).

## Part 1

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# Competing through logistics

# Logistics and the supply chain

## Teaching tips

Chapter 1 is the key scene-setting chapter of the course. The aim should be to *enthuse* students with the logistics challenge. In spite of the advances since we wrote edition 1, most supply chains today *still* do not deliver very good value to their end-customers. Resolving the deficiencies in information flow and material flow that comprise the root causes demands that logistics processes are improved both internally *and* between partners in a supply network. This is likely to keep logistics professionals busy for years to come! And indeed to place increasing demands for well-qualified logistics professionals. It is not difficult to persuade executive students of current deficiencies, because they are confronted by them every day. Full timers often have less experience, and so you will need to engage them by relating logistics problems to them as customers, for example:

- cannot find what they are looking for, and are forced to look elsewhere or to buy substitutes, or eventually to give up altogether!
- can see at first hand the primitive methods used for stacking shelves in supermarkets, and the awful conditions that apply when systems are under pressure at events like Christmas and the New Year;
- can see disused airfields full of unsold cars in many places across Europe.

We return to the logistics future challenge to round off the course in Chapter 10. Here, the teaching task is to convince students about *what the challenge is*.

Chapter 1 lays the foundations of the course by focusing on the contribution of logistics to ‘competitiveness’. Competitiveness needs to be considered at two levels:

- The level of the *focal firm*
- The level of the *supply chain*

Keeping these two levels in focus regularly during the course helps to get across issues like competing through logistics and strategic alignment. Secondly, we need to clarify the managerial and strategic perspectives of the logistics challenge:

- *Managerial*: supervising day-to-day logistics processes in terms of their time, cost and quality objectives.
- *Strategic*: formulating and implementing the guiding principles, driving forces and ingrained attitudes that are shared by partners across a supply network.



These perspectives are typically more explicit and clear at the level of the focal firm than they are at the level of the supply chain! Thirdly, we need to create *clarity* in logistics terms. This will pay dividends during the development of the course. So create clarity by getting definitions on the table for supply chains, SCM, logistics itself, material flow, and supply networks. As we state in the preface, we tend to use 'chain' and 'network' interchangeably: we prefer 'chain' for simple, serial links between organisations and 'network' for more complex linkages.

## Teaching objectives

- *To enthuse students with the opportunities presented by logistics today and the challenge of logistics tomorrow.* Here, the teaching objective is to lay the foundations of logistics today by presenting the broad picture and its implications for what the future vision should be. Therefore, you need to touch on the reality of what it is like today and what it should be like tomorrow, encompassed in the idealised vision of Figure 1.7. (We have replaced this with a SCOR version in edition 4).
- *To explain how logistics contributes to competitiveness of the focal firm in particular and the supply chain in general.* Here, we need to show how logistics underpins the competitive criteria for supply chain processes. Logistics contributes through quality, speed and cost, where it can directly influence competitive advantage. Supportive contributions are through controlling variability, dealing with uncertainty and acting responsibly. Logistics also has its limitations – such as product superiority and brand – which are strictly outside the logistics domain. However, logistics has an increasing role to play in coordinating with traditionally separate functional areas. Joint strategy making with marketing and trading is one example, so is 'design for logistics'.
- *To create clarity in logistics terms.* Here, the teaching objective is to ensure that we have clear definitions of logistics terms – such as logistics and supply chain management – that will help to create clarity as the course continues. So many terms, not least logistics and supply chain management, are still somewhat 'fuzzy' in the literature. We now use the CSCMP definition of SCM. The session founded on Chapter 1 is your opportunity to provide leadership in creating clarity!
- *To develop the notion that supply chains may choose to compete on different competitive criteria.* This is a key part of our philosophy, and it needs to be addressed right from the start. Later, we develop the implications of this philosophy, such as the need for working together, for differentiated KPI's, the distinctions between agile and lean strategies, and the need to align processes to different market segments. In particular, different segments imply different competitive criteria – and hence different priorities for order winning and qualifying criteria.

## Discussion points

Chapter 1 has six short cases, which can be used to help achieve the above teaching objectives. In addition, the section on supply chain management in R. Johnston *et al.*, *Cases in Operations Management*, 3<sup>rd</sup> edition provides several longer cases that can be used to augment those in the text.

**Case study 1.1:** The Tesco case study (updated for this edition) illustrates aspects of the logistics challenge facing a major retailer. Now undeniably global, Tesco now has a total of 6,984 stores and a revenue exceeding £65 billion. Seventy five thousand products to be planned and controlled. Sixty million cases per week are ordered, shipped, sorted by store and the contents put on display. And this all has to be achieved against three different temperature regimes across 27 distribution centres and over 3,000 stores. Further, Tesco's multi-channel approach now means that all these products are available on-line to be delivered to the end customers.

The Tesco case also gives an idea of the rapid turnover of stocks for fast movers, using such methods as day 1 for day 2 (order today for delivery tomorrow), pick to zero and store deliveries in four 'waves' during the day. We take our students to a grocery Regional Distribution Centre during the course to see for themselves the huge scale of the operation and the logistics processes at work.

- *Key logistics processes:* use the 'cow to end customer' slide (see accompanying slides for Chapter 1, Figure 1.1) to illustrate the material flow from raw material to end customer, and the accompanying need for information flow to trigger replenishment at each stage of the supply chain.
- *Likely problems:* with such a vast product range on offer, and such huge throughput volumes, we can say that the system is prone to error. Errors can range from failure to supply by a manufacturer and problems with the transport system to difficulties in sorting and identifying products in the RDC's and the stores. Problems such as these accumulate across the supply chain, and result in problems with on-shelf availability. On-shelf availability of good quality product in effect measures the performance of the supply chain as a whole.

**Case study 1.2:** Faced with a broad product range, here is an early example of a focal firm that recognised the need to tune its logistics processes in line with three types of delivery process. The case can be used to explore the futility of pouring more and more finished product inventory into the market place in the hope that customer service will improve. You always seem to end up with too much of the wrong models, and not enough of the ones that are selling well!

- *Improved Competitiveness:* Xerox achieved increased customer service levels (measured against the three types of delivery) with *lower* total inventory cost. Commodity products were still kept in stock, although the logistics challenge shifted to flexibility (to allow changes in volume and mix by SKU), simplicity (ease of manufacture) and speed of manufacture (to allow rapid replenishment cycles). Mid range products were redesigned so that a standardised ('vanilla') semi-finished product could be configured to customer requirements within 5 days of an order being placed.

**Case study 1.3:** We separate variability and uncertainty as distinct competitive issues. This case explores the knock-on effects of schedule variability by comparing the plan (monthly schedule) with the daily call-off quantities for four similar parts. The setting is the same component supplier (PressCo), and the schedule variability comparisons are between two of its customers, WestCo (Ford) and EastCo (Toyota). The comparison is striking: WestCo will be faced with much increased inventories in its inbound supply chain, while EastCo has a much more controlled inbound flow. BUT: this depends on having a 'fixed' monthly schedule supplied by EastCo. This means that EastCo must fix its own vehicle assembly schedule a month in advance, which means in turn that it has developed a production system that is not as responsive

to market changes as WestCo's. However, there are many advantages to inbound logistics at the assembler, and also to supplier production efficiencies. Responding to the questions posed,

- *Logistics implications:* the supplier must hold much higher inventories for WestCo. We calculated that over 5 days' of inventory would be needed to provide full service levels across all part numbers. In practice, this would be impossible because of the operational problems involved in replacing batches at short notice, and perhaps 95% service levels may be achievable with the higher stock levels. Stock levels for EastCo are a matter of a few hours, because it was possible to use the stable schedules to concentrate on operational problems and to iron out imbalances in the production process.
- *Steps the supplier must take:* PressCo must set up a separate stock room for supplies of components to WestCo. Also, it is essential to separate the production facilities for supplying WestCo and EastCo. Otherwise, the inefficiencies of supplying WestCo will hobble the streamlined ('lean') production system for EastCo. For pressed metal parts, this means duplicating some expensive equipment, such as presses.
- *Which would be the more efficient?* From the foregoing, it is self-evident that the manufacturing cell ('separate part of the factory') for EastCo is likely to be more efficient than the cell for WestCo. Because the loading on the WestCo cell is changing on a daily basis, it is very difficult to plan ahead in an orderly way, or to develop the efficiencies that are possible with the cell for EastCo. Better flow and orderliness also create major benefits to product quality.

**Case study 1.4:** While case study 1.3 focuses on the impact of variability on logistics, this case focuses on the impact of *uncertainty* and responding to supply chain disruptions. In theory, WestCo could reduce schedule variability by changing its scheduling systems – and give both its suppliers and its own assembly processes a much easier life! Uncertainty on the other hand is by definition responding to the unknown. Dealing with uncertainty better than competitors are able to do places a focal firm at a relative advantage. We use the Shawney (2006) definition to distinguish between pro-active and reactive responses. This case shows how P&G used a reactive response to a supplier problem that was completely unanticipated yet had the potential to cause large scale shortages of P&G nappies. It shows how their fast response to the loss of a critical chemical plant not only avoided a shortage of nappies but improved their relationship with the supplier. Responding to the question posed the key lessons from the case,

- While the timing of the chemical plant explosion could not be anticipated this is an event that is unlikely to happen, but if it does the consequences are catastrophic for the supply chain. Therefore, one lesson is that contingency plans for unanticipated yet critical supply disruptions like this, should be established, such that when disaster occurs there is a plan for alternative supply which can be immediately activated.
- Speed of response is vital when dealing with the scale and scope of P&G and the SC team certainly reacted quickly.
- Involve suppliers from the outset. P&G worked with Nippon Shokubai, who responded by providing the most senior support (Chief Procurement Officer) to identify solutions. The high level of collaboration between P&G and Nippon resulted in the ideal solution of re-commissioning a mothballed plant in the USA.

- The final lesson is re-planning the supply chain (see Sales and Operations Planning in Chapter 7) to take into account the disruption and the reduced supply capacity. P&G did this by delaying some new product introductions, while ensuring that zero shipments of existing products to customers were missed.

**Case study 1.5:** We introduced sustainability as a third ‘supportive capability’ in edition 4, because it has clearly ‘come of age’. Logistics decisions are today very much at the heart of a focal firm’s efforts to improve its ‘green credentials’. Here is a focal firm which has taken the need for sustainability on board, and has developed some challenging targets to start embedding sustainability into the company culture. Sir Stuart Rose (formerly Executive Chairman, standing down in 2011) was motivated to launch Plan A after watching Al Gore’s documentary ‘An Inconvenient Truth’, which he then required his top team to see *en masse*.

The study question goes to the heart of taking sustainability seriously in a focal firm. Using Elkington’s ‘triple bottom line’, you can explore the trade-offs between the economic risk of €300m (highly visible to shareholders) and the potential social and environmental gains – which are hard to quantify in financial terms. Indeed, the conflict between commercial growth and a commitment to reduce greenhouse gases led the firm to decide to decouple the two. Calling Plan A ‘a clever gamble’, fsn.co.uk says that M&S calculates that ‘ethical and environmental considerations will continue to influence retail spend on food and clothes’. In other words, M&S believes that a commitment to sustainability increases sales. Indeed they now claim its what their customers ‘want them to do’.

But many of the Plan A goals are unquantifiable, such as ‘extending sustainable sourcing, helping improve the lives of people in our supply chain, helping customers and employees to live a healthier life style. The impact on the perceived goodwill of the firm appears to offset these rather fuzzy concepts, and M&S has enjoyed widespread praise for the stance it has taken.

FSN comments ‘responsibility for meeting the achievements set out in Plan A remains an integral part of the role of the company’s Finance Director, Ian Dyson. By integrating corporate responsibility within the finance department’s function, M&S has ensured that sustainability issues will be considered as part of the company’s growth strategy, potentially avoiding a source of tension between the corporate goals of profitability and sustainability. Many companies keep a firm distance between the sustainability and finance functions, with the result that environmental and ethical sustainability are subservient to overall business strategy’. This connection should help keep sceptical shareholders a little more supportive!

**Order winners and qualifiers:** this is a key concept in getting across the need to differentiate logistics strategy. You can use a blank of Table 1.2 in the text to ask the class to complete the characteristics of the two types of product range. Use examples such as M&S and Zara to help illustrate the issues raised. There is bound to be debate about some of the order winners. For example, Zara’s materials do not have to last long because of the fashion nature of the offering, so product quality (in terms of grade of material) is less important. Availability is a classic qualifier that is order-losing sensitive. If it is not on the shelf, the likelihood is that the sale has been lost.

- This key learning objective can be further supported by using the case ‘New Supply Chain Strategies at old M&S’ (see Johnston *et al.*, (2003) *Cases in Operations Management*, edition 3, Pearson Education). This case has been written around the differentiated strategies for women’s clothing ranges at Marks and Spencer, using 3 product ranges

(Perfect/Classic, Autograph, per una) as examples. It enables Table 1.2 to be completed for these ranges. Discussion can then turn to how the logistics priorities can best be met for each one.

**Case study 1.6:** This case looks at the alignment needs across five tiers in an aftermarket supply chain. It is apparent that there are major issues that will impact on service to the end customer.

- *Winners & Qualifiers at TA:* the end customer is concerned with getting a breakdown fixed as quickly as possible. Therefore, delivery speed and reliability are order winners, while price is a qualifier (there is a ceiling beyond which the customer would not go!).
- *Winners and Qualifiers at the Component Supplier:* the view from the opposite end of the supply chain was that price was priority number one. Presumably, delivery reliability was a qualifier.
- *Impact on Customer Service:* the principle of alignment says that links in a supply chain that are directed towards conflicting competitive priorities will not perform as well as a supply chain where the links are directed at a consistent set of competitive priorities. Price and delivery speed are two such potentially conflicting priorities.

# Putting the end-customer first

## Teaching tips

The aim of this part of the course is to *convince* students that it is the behaviour of end-customers that ultimately drives the supply chain, and to *explore* the implications in terms of development of supporting logistics capabilities. The challenge here is to support products in the market place better than competition. The starting point is *customer segmentation*, a marketing concept which seeks to ‘describe the market as simply as possible while doing our best to emphasise its variety’ (Millier and Palmer). In edition 5, we consider the supply chain strategy implications of the conventional marketing approach to market segmentation and conclude that there are few implications and therefore supply chain need to use a different segmentation approach. A supply chain relevant approach to market segmentation will first require an understanding of the demand profile as described in Section 2.3. The aim is to answer the questions ‘how many, where and when – for each SKU in the range and for each distribution channel’.

Another way to link marketing and logistics is by means of the concept of *quality of service*, which seeks development of logistics capabilities and practices needed to support different segments. Finally, in Section 2.5 we describe the complexities of segmented supply chain strategy and a pragmatic 4-step approach that companies can use to develop it.

While it can be helpful to enlist the help of a marketing colleague to help prepare this session, it’s not a good idea to delegate it because of the need to integrate the logistics message. This session should aim to integrate marketing principles with logistics – do not let any part of it become a ‘stand alone’ marketing session! The starting point for this session should therefore be the development of a clear understanding of the marketing perspective on logistics and in addition to Section 2.1 you might find Section 2.5.1 helpful as it considers the alignment of supply chain and marketing. Then you can consider how logistics should respond to this perspective by developing quality of service. Too often, customers are segmented in terms that bear little or no relationship to the logistics capabilities that are needed to support them. Use examples to illustrate, such as a bottle of Coke ‘should always be within reach’, or a ‘perfect pint [of Guinness] in every pub’ to translate marketing speak into logistics realities. Case study 2.2 shows how easy it is to develop ‘segmentation’ that is not actionable in logistics terms. ‘National accounts’ bear little relationship to buying behaviour!

## Teaching objectives

- *To convince students of the need to place the end-customer first in logistics strategy development:* while this point was made towards the end of Chapter 1, this is the session to reinforce the message. Develop the marketing perspective, and why it has such a major impact on logistics.



Harrison, van Hoek and Skipworth, *Logistics Management and Strategy*, 5<sup>th</sup> edition,  
Instructor's Manual on the Web

- *To show how end-customers can be grouped together according to their needs:* we need to understand end-customers and their behaviours. Segmentation is not the preserve of marketing: it is key to the development of logistics capabilities because it informs us of the priorities that are needed to improve service quality.
- *To compare the marketing approach to segmentation with the logistics approach:* forecasting demand needs marketing input in the same way that market segmentation needs logistics input. While one can easily get carried away with the technical aspects of demand forecasting, the key point is to explain its role in the supply chain, and to show how it should aim to serve the end-customer better.
- *To explore the implications of an 'end-customer comes first' logistics strategy:* show that different capabilities are needed to support different market segments. To reinforce the point, Table 2.1 analyses differences between industrial and consumer markets. Use Table 2.1 to compare marketing mixes for a consumer product like a washing powder with an industrial product like electric motors. Having analysed the differences under the first 6 headings, home in on the 'place' element. Washing powders are distributed from a manufacturer's national distribution centre (NDC) via retailer Regional Distribution Centres (RDC's) to retail stores. DC motors are usually made (and delivered) to order, while AC motors are standard products that are sold via distributors in each territory. The point is that these are different channels to market, and have been crafted by understanding end-customers and how they do business. That's not to say that the channels cannot be improved!
- *To show how logistics supports development of customer loyalty through quality of service:* start with the service quality 'gap' model (Figure 2.4) and use it to explore customer expectations, service specifications and service delivery. 'Gaps' can develop between any or all of these over time. You can use the IKEA case (Case study 2.3) to illustrate. Go on to show how customer loyalty has been exploited by such concepts as value disciplines and customer relationship management.
- *To emphasise market place dynamics:* Nothing stays still for very long in today's turbulent market places! Order winners today become the qualifiers of tomorrow, and a focal firm and its supply chain partners need constantly to be thinking about how logistics strategy needs to be evolved and honed over time. You can illustrate this point by reference to both the Powerdrive case (Case study 2.1) and the Batman case (Case study 2.4). The former shows the perils of allowing logistics capabilities to become out of tune with the market, the latter case shows how it's possible to develop a pro-active set of capabilities that become progressively more difficult for competitors to copy.

## Discussion points

Five case studies have been designed to help you to illustrate the above points:

**Case study 2.1:** *Powerdrive Motors* illustrates customer service as a link between logistics and marketing. It highlights the impact a change in strategy has on quality of service, and considers the various elements of customer service.

- *Transaction elements:* These are the customer service elements of physical distribution involved in getting the right product to the right place at the right time.