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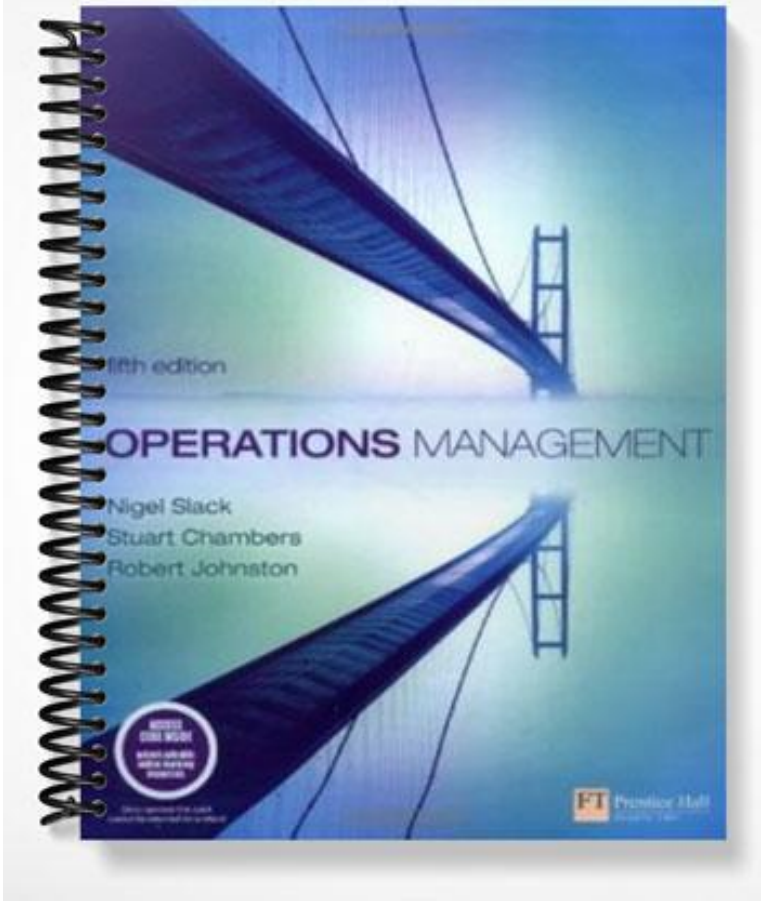

Instructor's Manual

Operations Management

Fifth edition

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ISBN-13: 978-0-273-70850-6 / ISBN-10: 0-273-70850-3

FT Prentice Hall
FINANCIAL TIMES

An imprint of Pearson Education
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Edinburgh Gate
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Essex CM20 2JE
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First published 2007

ISBN-13: 978-0-273-70850-6
ISBN-10: 0-273-70850-3

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CHAPTER 1

Operations management

Teaching guide

Introduction

Teaching the material in Chapter 1 of the book is both the most important and the most difficult part of teaching an operations management course. It is the most important because it is vital that students develop an enthusiasm for the subject and this is best attempted early in the course. It is difficult because one has to establish some key principles before the 'building blocks' of the subject have been taught. We have found it useful always to work from whatever experience the students have. For post-experience students like MBAs this is not difficult. One can always ask them to describe the nature of operations in the companies they have worked for. One can even explore some of the prejudices they might hold about operations management (dull, obstructive, always screwing things up, etc.) and base the discussions on that. Undergraduates are more difficult to teach because they usually have less experience, but even so they have experienced many different operations from a customer's point of view. Therefore, one can ask them about their recent experiences as a customer (both good and bad) and base a discussion on the importance of operations management around those experiences.

Key teaching objectives

- To enthuse students with the 'hands-on' excitement that can be gained from an understanding of operations management ('… I want to prevent you ever enjoying a theatre performance, restaurant meal or shopping experience ever again. I want you continually to be looking for the operations implications of every operation you enter. You are going to be turned into sad people who cannot go anywhere without thinking of how you could improve the process').

- Convince students that all organizations really do have an operations function; therefore operations management is relevant to every organization.

- Convince students that all managers are operations managers because all managers manage processes to produce outputs ('Even marketing managers are operations managers. What you learn as marketing in business school is really the "technical" side of marketing. Of course this is important, but marketing managers also have to produce marketing reports and information, without mistakes in them, on time, relatively quickly, flexibly enough to contain the latest information and without using an army of marketing analysts to do so. In other words, they are producing services for internal customers').

- To introduce the key ideas in the chapter, namely,
    - Operations managers manage transformation processes, with inputs and outputs.

- Operations can be analyzed at three levels, the level of the supply network, the level of the operation itself (sometimes called the *level of the organization*) and the level of individual processes.
- Operations differ in terms of their volume, variety, variation and visibility (the four Vs).
- Operations managers engage in a set of activities, devising operations strategy, designing operations, planning and controlling operations and improving operations.

Exercises/discussion points

There are many cases and exercises that one could use to introduce operations management. The companion volume to this book (Johnston, R. et al, 2nd edition, ISBN 0 273 624962) contains several useful cases. In addition, you might like to try some of the ideas given in the subsequent text, all of which we have used.

- **Teaching tip –** Use the pie chart that shows the consultancy spend in each functional area (a PowerPoint version is available with the other PowerPoint slides) to prompt a discussion. For example, '*Operations and process management is the biggest single sector of spend in the consultancy market. Why do you think this is'?* Try to guide the discussion to the idea that excellence in operations management reduces the cost base of the operation **and** helps to bring in more revenue. We call this the 'double whammy' effect of operations. No wonder it is important when it can do both these things. '*Remember the old adage, profit is a very small number, made up of the difference between two very big numbers. It only takes a bit to be taken off costs and bit to be added on to revenue to make a big difference to profit'*.

- **Exercise –** A useful exercise for demonstrating the ubiquitous nature of operations is to ask the class to identify every service they have encountered from waking up in the morning to going to bed at night. The radio alarm which wakes them up depends on the operations of the radio station. The water in which they wash (presumably) was delivered by a water utility. The public transport operation transported them to college, etc. etc., through to the bar, or other place of entertainment that they finish the day with.

- **Teaching tip –** Many television programmes can be recorded off-air, which illustrate operations. Looking 'behind the scenes' of well-known operations such as airports, is a favourite topic for TV producers. Any of these could be used to promote group discussions on what operations management might be like in such operations.

- **Exercise –** The four Vs dimensions of operations can be used for many types of exercise. For example, one could ask different groups to identify different types of restaurant, food retailer, car servicing operation, cinema, club or pub and plot the 'similar but different' operations on the four dimensions.

- **Exercise –** For residential courses, especially for post-experience students, an evening could be spent 'on the town', where syndicates are required to sample the services of a restaurant, a retail operation and an entertainment operation, and report back the following morning. This is a great way of giving participants a change of scene on the Thursday of a one-week course.

- **Teaching tip –** Remember 'role-play' can be used effectively in an introductory session. The lecturer can role-play two operations managers managing separate similar but different

operations, for example, the chief tailor of a 'fashion label' and the production manager at a mass-produced 'off-the-peg' garment factory. The differences in the types of resource (people and equipment), the operation's objectives, the four Vs and so on can all be emphasized during the role-play.

- **Teaching tip –** 'Role-play' can also be used with a standard case study. For example, the Concept Design.

  Services case at the end of Chapter 1 lends itself to role-playing the operations manager and marketing director of the company, to illustrate their different perspectives.

- **Exercise –** All the chapters start with an example of 'Operations in practice' . It is often a good idea to ask the students to read through this example and then use it to promote a discussion on the topic. In this chapter IKEA is described. Questions such as the following could be used to prompt discussion.

  1. Did the company simply conform to the conventional operations model in its sectors or did it devise something new?

  2. What did the company do differently from previous furniture retailers?

  3. Why do you think it decided to be different from other companies in its sector in the way it manages its operations?

  4. What advantages did making these changes give it?

See later for suggested answers to these questions.

- **Teaching tip –** It is always worth illustrating the ideas in operations and process management with reference to not-for-profit organizations. Charities, local government organizations and particularly health care services (although some of these are private) provide a wealth of examples. For example, try asking the students to contrast an accident and emergency (A&E) department of a hospital with a unit that specializes in cosmetic surgery. The former has to cope with very high variety, high variation and high visibility. Demand is relatively unpredictable and it must provide fast and responsive service (relatively at least, it would be measured in minutes and hours rather than weeks and months). The cosmetic surgery unit by contrast, may still have high variety but, because patients are able to wait, it is unlikely to have very high variation. Because of this, the process can be planned and scheduled in advance so that there will be far higher utilization of the process's resources.

Case study teaching notes

Design House Partnerships at Concept Design Services

This exercise is best used as an introductory exercise towards the beginning of any operations management course. It is a 'soft' exercise in that many of the issues are in the form of opinion.

Some notes on Design House Partnerships at Concept Design Services

This is quite a complex case in some ways. Its purpose is not to provide students with an opportunity to 'solve a problem'. Rather, it is an introductory case (in spite of its complexity) that can be used to open up a number of issues for discussion. Its overall purpose is to introduce students to the richness and complexity of many problems within operations management.

Three characters are involved in the case study. Linda Fleet is the Head of Marketing, Grant Williams is the Operations Manager, and Jim Thompson is the CEO of the company. Once you are familiar with the case it is sometimes effective to role-play one or more of these characters for the benefit of the class, with them asking questions of the characters and the lecturer providing any further detail or clarification through this mechanism. Also, it is useful to use props to illustrate the type of products this company designs, makes and distributes. For example, bring in a basic plastic bucket to illustrate Focus products, a more expensive 'upmarket' item of plastic homeware to illustrate Concept products, and a plastic item from a design house (such as Alessi) to illustrate the Design House Partnership products.

Why is operations management so important in this company?

This is a big question and it is best to tackle it both at a strategic and an operational level.

At a strategic level, operations management has provided the capability, particularly in the design and manufacturing parts of the organization, that allows the company to compete so effectively. Draw the students' attention to the final part of the case where the CEO expresses the view that the important changes in the company have come because of it being able to deploy operations superiority of some sort.

At an operational level, one could point out the designs that are cost effective and delivered on time to allow the company to be first into the market with new ideas. Products made to high levels of quality, when they are needed, and at reasonable cost, will allow the products to be sold effectively and prevent customers' complaints as well as saving the company money. Distribution processes that provide good customer service without excessive stock levels will maximize sales whilst minimizing costs.

Early in the class discussion it is useful to make sure that students understand that there are three types of operations represented in this company.

- A design operation that produces the designs for products, sometimes in cooperation with design house designers.
- Manufacturing operations that actually produce the products.
- Distribution operations that take customer orders at its call centre, assemble the order from the products it keeps in store, and physically distribute the products to the customer.

All of these operations are important to the company because:

- they all contribute to the company's ability to serve its customers and therefore retain old customers and gain new customers.
- all contribute to the company's costs and therefore, if managed efficiently, can reduce the costs for the whole business.
- all, if not managed well, can disrupt the flow of products to customers and negatively impact on the company's reputation.

Another way of answering this question is to look at the contribution of operations management as it is described in Chapter 1 of the book. In the chapter, four contributions of the operations function were identified. These are as follows:

- Minimizing cost
- Maximizing revenue
- Avoiding excess investment
- Developing capabilities for future innovation

Ask the class how different parts of the company contribute to each of these objectives.

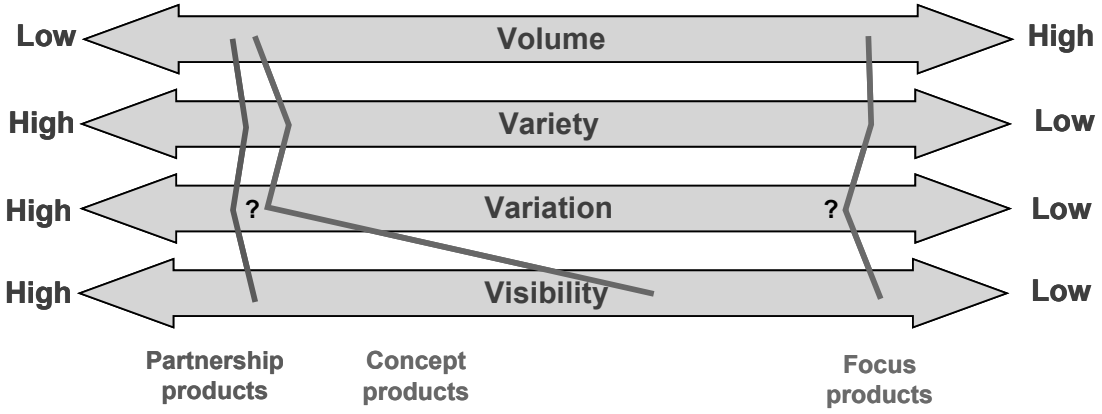
Draw a 4Vs profile for the company's products/services

A four Vs analysis

Although there is not enough information in the case to perform a rigorous four Vs analysis there is enough to make an informed approximation of what the four Vs profiles of the different product group would look like. Start by establishing that the students understand the nature of volume, variety, variability and visibility Then ask them to describe the company's three main product groups, Focus products, Concept products and Design House Partnership products. After that, it could be useful to make a matrix and hold a discussion about what the four Vs mean for each of these product groups. The most difficult is variation because little information is given on this in the case. However, with a little discussion, it becomes clear to students that the basic stable products that represent the Focus group will be less prone to seasonality or sudden fashion changes than either Concept products or Design House Partnership products. For the latter, the fashion element will introduce a degree of risk and uncertainty as to how sales may develop.

The nature of visibility is also a little unclear. Broadly, the company's operations are low or fairly low visibility operations. Yet there are comments in the case that indicate that Design House Partnership requires a higher degree of contact with the customer, who in this case is Design House itself. The company's designers must collaborate with the design houses' designers. Also, Grant comments that the Villessi designers frequently visit Grant's factory.

4 Vs analysis for Concept Design Services



What would you recommend to the company if they asked you to advise them in improving their operations?

This is an opportunity for a general discussion based on the analysis of the first two questions. One way of approaching this question is to ask the class to identify the challenges or problems that are identified in the case. These may include the following.

- The move from a company that sells directly to retailers (Focus and Concept products) to one that sells predominantly to design houses (Design House Partnership products).
- The emerging differences between product groups. The four Vs analysis indicated that Focus has a very different four Vs profile when compared with both Concept and Design House Partnership products. What are the implications for this in how the company processes these three product groups?
- Are the resources in the company's operations appropriate for these product groups? The main point here is that the type of machines and people necessary to make Focus products (high volume/low variety) may be very different from the kind of machines and people required to process Concept and Design House Partnership products. For example, the large machines that the company has recently bought, together with multiple impression moulds, seem to be ideal for Focus products that are high volume, low margin, low variety. After all, the disadvantage of these large machines and moulds is that they take a long time to change over between products. Yet there would be relatively few changeovers when making Focus products. By contrast, both Concept and Design House Partnership products are low volume, high variety products that need a far more flexible set of processes to produce them. It is unlikely that the large machines and multiple impression moulds used by the company are ideal for this. Therefore, there is some evidence that, in trying to use the same resources to make all its products, it is making life difficult for itself. This is possibly the reason why its schedules need to change so frequently.
- The manufacturing operation seems to be in conflict with the design operation.
- The manufacturing operation seems to be in conflict with the marketing function over the accuracy of its forecasts. Discuss with the class why manufacturing needs better forecasts and why marketing may genuinely find it difficult to give them in these circumstances.
- The company admits that it is having some problems in subcontracting Focus products. Discuss with the class why this might be and why subcontracting is such a popular option currently.

Model answers to suggested questions on IKEA

How is the IKEA operations design different from that of most furniture retail operations?

Although some furniture retailers do have large 'out of town' operations, many use premises within town or shopping malls. IKEA's operations are very large and purpose-built. They feature very large car parks and are located close to major motorway intersections. In fact, everything about the design of IKEA's operations encourages high volume of throughput. This high volume means that many of the fixed costs of running the IKEA operation such as local taxes, administrative costs and some energy costs are spread over a high volume of individual sales transactions. This reduces the overall cost of making a sale, a part of IKEA's strategy of offering good value for money. The variety of **products** sold in IKEA stores is relatively large compared with many furniture retail operations. For example, it includes small items such as glassware and kitchenware as well as very large items such as sofas, tables and shelving systems. Modular design of some products such as shelving systems allows variety to be extended even

further from a few basic component parts. These components can be assembled together (by the customers) in different ways to offer an almost infinite variety of combinations. However, as far as the variety of **service** is concerned, it is relatively narrow. Most products are sold in cartons, customers are left to make their own decisions without interference from sales staff (though advice is available if requested), and even when ordering special products the staff only take down the order in a standardized form. The checkout operation, where customers pay for the goods, is also highly standardized, with everyone going through exactly the same sequence of activities. Even delivery to the customers' home is largely a matter of the customers carrying the goods themselves in their own cars (though a delivery service is also available). As far as demand variation is concerned, weekends and public holidays are much busier than working week days; therefore variation is relatively high. However, from IKEAs experience, demand is relatively predictable. Because of this predictability, they can plan to have more staff available at busy periods. However, because customers are encouraged to perform much of the service themselves, the need to fluctuate staff is less than it would be in a conventional store. Also in conventional stores, because of the high level of expertise and customer contact required, it is much more difficult to obtain the services of part-time staff during peak demands. The relatively standardized and simplified service given by IKEA makes it easier to schedule part-time staff in busy periods. Finally, customer contact is, in some parts of the operation, high, but overall it is lower than in most furniture retail operations. Customers are responsible for choosing the types of furniture they require, working out whether the furniture would fit together in their own home (special sheets and tape measures are provided by IKEA to help customers do this), filling in order forms when special furniture has to be delivered, serving themselves with smaller items into trolleys, entering the warehouse area and picking out from the warehouse shelves the larger items that are in cartons, transporting the goods through to the checkout and finally loading the goods on to their own car. Most of this occurs with very little customer contact. In many instances the only point at which interaction takes place between customer and service staff is at the point of payment. In effect the customer is 'trained' to perform much of the value adding part of the service themselves. Clearly this cuts down the costs of the transaction as far as IKEA is concerned. These savings can then be passed on to the customer.

What do you think might be the major problems in running an operation like IKEA?

The dependency on a high degree of customer participation has some advantages but it may also have some drawbacks. Customers need to be 'trained' by clear use of signage, by instructions within the brochures and catalogues and by observing other customers behaviour. Furthermore, the store needs to be laid out such that it is difficult for customers to deviate from the standard route through the store to the checkout. However, some customers may not behave in the prescribed manner and staff will need to be able to cope with these exceptions. If customer training is not well handled several difficulties can arise. For example, customers may pick up goods from shelves or the warehouse, change their mind and then leave them around the store in unsafe positions. Alternatively, if customers are puzzled by the nature of the operation they will need tactful help from customer contact staff. The other major problem facing the store would probably be stock availability. The system works best when all items requested by customers are in fact in stock. Out-of-stock items not only disappoint the customers but also cause extra cost in terms of administration and ordering. This is an especial problem in modular based products such as shelving systems. If one particular module is not available it could impact on a large proportion of the customers who want to purchase some combination of modules.

What do you identify as the 'operations function' within IKEA? How is this different from the 'sales function'?

The overall macro operation at IKEA is concerned with serving customers with their required furniture products. In this sense it is a customer processing operation. However, to achieve this there are in effect two parallel sets of micro operations. The first one deals with the flow of customers such as the showroom, the child-minding facility, the checkout operation and so on. The second set of operations are concerned with material flow. These are items such as the goods inwards receiving operation, the warehouse operation and the shelf stocking operation for the smaller items. In effect these two sets of micro operations are arranged so that products are 'assembled' for the customers (or looked at another way, the customers assemble themselves for the products!). It becomes clear that practically everybody within the store is concerned in some way with one of these two sets of micro operations, either transforming customers or transforming material. This means that the operation of 'making the sale' and therefore 'satisfying customers', although sales activities, are in fact the heart of the operation itself. In contrast, the marketing operation is concerned with the technical decisions of pricing, promotion and product selection and so on. These decisions are probably taken at regional headquarters (that are information processing operations in effect).

Model answers to short cases

Acme Whistles

1. **What is the overlap between operations, marketing and product/service development at Acme Whistles?**

The simple answer to this question is, 'There is a very significant overlap between these functions'. The underlying question is 'Why'? Partly, the reason is size. As Simon Topman says in the example, small companies cannot afford specialist functions so at a managerial level everyone does everything to some extent. This becomes especially true when the boss of the company is also the owner. It is literally his own money that is being spent when creating any new managerial roles. Partly also the tradition and competitive stance of the company has an influence. This is a company that competes on quality and innovation. Both these things rely on informal communications within the organization and a fast moving, agile ability to checkout and implement new ideas.

Oxfam

1 What are the main issues facing Oxfam's operations managers?

Broadly, Oxfam will have the same issues as any other operation. They must define their strategic objectives, design appropriate processes that deliver appropriate services, plan and control those processes, and continually adapt and improve how they deliver their services. But they also have some particularly difficult challenges because of their status as an emergency and caring organization.

- They must provide a global service. By definition, Oxfam's scope of operations is global. Anywhere a disaster is likely to strike could receive the attention of the charity. However, much of Oxfam's work is not concerned with the high profile disaster relief side of its business, but rather the ongoing community development projects it undertakes. Most of these projects will be in the poorer, less developed parts of the world. The implication of this is that, from an operations point of view, services must be delivered without an assumed level of infrastructural support. The ability to adapt development methodologies to such circumstances would be a key operations task.

Another aspect of globalization for Oxfam concerns the coordination of expertise. Experts, either in development or disaster relief, may be located anywhere in the world. The task of understanding and coordinating this pool of potential help must be a major operations task. It will rely on maintaining a database of expertise and on the ability to deploy it, sometimes at short notice.

- They must be environmentally ethical. To Oxfam, the concept of environmental management must be tackled at two levels. The most obvious one is that environmental awareness is an 'output' from the charity's operations. In other words, environmental management, to some extent, is one of the operation's 'products'. It will engage in lobbying governments and non-governmental agencies to achieve its aims of greater environmental sustainability. However, there is also another related issue. Oxfam's operations themselves must also be environmentally sound. Agricultural projects, for example, must be managed to ensure that there is no inappropriate use of fertilizers and pesticides locally, even when there may be local pressures to do so.
- They must be socially responsible. Again, this is one of those issues, which is both an output from the operation and an objective for the way it runs its own operations. A key issue here must be the way in which the 'on the ground' managers of development projects tackle some of the particularly sensitive cultural issues. For example, 'gender issues' are one of Oxfam's campaigning points; however, appropriate gender roles are seen in very different ways in different parts of the world. Pursuing its own ends in terms of, say girls' education, must be balanced against traditional ideas of women's role. Whereas this difficulty may be relatively straightforward to reconcile at a strategic level back in the charity's Oxford headquarters, its success depends on how local operations managers deal with the issue at a day-to-day level.

Prêt A Manger

What are the advantages and disadvantages of Prêt A Manger organizing itself so that the individual shops make the sandwiches that they sell?

There are a number of advantages in this type of organization.

- The load on the staff in the shop is equalized throughout the day. The demand from customers for purchasing the sandwiches occurs mainly in the middle of the day. If the staff only sold sandwiches, they would be busy in the middle part of the day and unoccupied at other times. The way Prêt a Manger organize their processes, the staff can occupy themselves making sandwiches in the early part of the day, then, as the day progresses, staff will progressively move from making to selling. As demand then reduces towards the end of the day, staff will move onto general cleaning and tidying activities as well as making ready for the same cycle of activities to repeat itself the next day.
- There is clear and direct responsibility for quality, customer service and cost. If there are any problems with quality and availability of sandwiches, it is the same staff who caused the problems who receive customer complaints (In fact, Prêt a Manger get very few complaints). Similarly, the effectiveness of cost control can be clearly associated with the staff in the shop.
- It is a more interesting job that has a number of different activities (making, selling, cleaning, etc.) than one where an individual will specialize in just one of these tasks.
- It is easier to engender a sense of pride in the high quality and wholesome nature of the products when they are made on the premises.

- It should be pointed out that there also disadvantages. The main one is that the cost of making sandwiches in a sandwich factory (the way the vast majority of sandwiches are made) is very significantly cheaper because of the higher volume.

How can effective operations management at Prêt A Manger contribute significantly to its success? And what would the consequences of poor operations management be in this kind of organization?

- By developing a culture within each store that takes pride in the products themselves, the way they are made and the way customers are served.
- By listening to customers so that customers' reactions and comments can inform the design of new products.
- By not wasting materials through poor control, which would increase the cost of running the operation.
- By developing a sense of fun as well as a sense of commitment in the staff so that customers sense a friendly and relaxed atmosphere.

Two very different hotels

1 For each hotel, what is the role of technology and the role of the operation's staff in delivering an appropriate level of service?

For Formule 1, technology is harnessed in the manufacture of the self-contained bedroom units in the factory prior to assembly on the site. Because of the standardization, conventional factory automation can be used to some extent. More obviously, during the running of normal operations at the hotel, technology, in the form of the automatic 'booking in' machine at the door, allows the hotel to remain 'open' even while it is unstaffed for much of the day. This saves labour. Similarly, labour is saved by the use of automatic cleaning in the washrooms. This also ensures that high standards of cleanliness are maintained throughout the day, even when the hotel is not staffed. Although not mentioned in the text, Formule 1 hotels also have automatic drinks and snack dispensers, which would allow guests to stave off hunger and thirst even though the hotel does not provide food in a conventional restaurant setting.

At the Mwagusi Safari Lodge, very little technology is used. The attraction of the hotel lies in its location and in how their staff treat the guests. Staff must not only be informative and courteous, they will also need to protect and reassure those guests who are anxious in their surroundings and create a sense of adventure (but not too much adventure).

2 What are the main differences in the operations management challenges facing the two hotels?

The main difference is the degree of standardization in the operation's processes. For Formule 1, the main use of standardization is in the manufacture of the individual room units. All room units are exactly the same size. Because they all have the same fitting, these fittings can be partly installed at the factory. This allows the company to buy furniture, curtains, and carpets in high volumes, keeping costs down. The standardized nature of the units also allows the hotel to be constructed quickly (which itself saves costs) using standardized methods of construction that are cheaper than building entirely different hotels at each site. Standardization of rooms also allows a standardized procedure to be adopted for cleaning and maintenance, so staff can be easily trained using a standardized training package. Finally, standardization of the room units, paradoxically, allows all Formule 1 hotels to adapt to the geography of the site. By putting the standard units together, like children's building blocks, they can use unusually shaped pieces of land, which tend to be cheaper than regularly shaped sites. By contrast, the Mwagusi Safari Lodge provides experiences 'customized for every visitor's requirements and abilities'.

Also, the Mwagusi Safari Lodge must be able to cope with fluctuations in demand through the year. However, Formule 1 try to choose locations that capture the business traveller market during the week and leisure travellers at the weekend.

CHAPTER 2

The strategic role and objectives of operations

Teaching guide

Introduction

Although the two topics covered in this chapter (the strategic role of operations, and the objectives of operations) are related there is no strict requirement to teach them together. Often we incorporate the first part of the chapter (the strategic role of operations) into our general introduction to operations strategy and either have a separate session on operations performance objectives or, if time is short, incorporate it in to the introductory lesson with the material from Chapter 1. Both the topics in this chapter are important but the concept of 'strategic role' is a difficult one for undergraduates to understand. We have found that undergraduates with some experience can get something out of the issues in this section but those without any work experience find it difficult. Certainly, students with experience such as MBAs or executive course participants can get a lot out of the idea of 'strategic role'. The Hayes and Wheelwright Stage 1 to 4 model, especially, is very useful to teach this easily.

Key teaching objectives

- To stress to students the importance of how the operations function sees its role and contribution within an organization (' … you can go into some organisations and their operations function is regarded with derision by the rest of the organisation; how come, they say, that we still can't get it right. This is not the first time we have ever made this product or delivered this service. Surely we should have learned to get it right by this time! The operations people themselves know that they are failures, the organisation does nothing but scream at them, telling them so …. Other companies have operations functions who see themselves as being the ultimate custodian of competitiveness for the company. They are the A team, the professionals, the ones who provide the company with all they need to be the best in the market …').

- To show students that there is a progression of operations excellence (using Hayes and Wheelwright's nomenclature) from Stage 1 to Stage 4.

- To demonstrate that there is a whole range of performance criteria, which can be used to judge an operation and which operations managers influence ('…although cost is important and operations managers have a major impact on cost, it is not the only thing that they influence. They influence the quality, which delights or disappoints their customers, they influence the speed at which the operation responds to customers' requests, they influence the way in which the business keeps its delivery promises, they impact on the way an operation can change with changing market requirements or customer-preference. All these things have a major impact on the willingness of customers to part with their money. Operations influences revenue as well as costs.').

- To demonstrate that for each performance objective there are internal and external benefits.

Exercises/discussion points

- **Exercise –** Teaching the importance of the strategic role of operations using the Hayes and Wheelwright Stage 1 to 4 model is best done (we have found) by relating it directly to the students' experience. Trying to use the model on a case study was found to be difficult. Any case study which incorporates all the relevant information, would be excessively long. Instead, try the following exercise.

- **Teaching tip –** Teaching the nature and importance of the various performance objectives can be done in two ways.

One can look at each performance objective in turn using examples of where the particular performance objective has a special significance. For example,

  - **Quality** – Use any company which competes especially on quality. High quality hotels and restaurants can be used, as can luxury services such as high price hairdressers and so on. This can prompt a useful discussion regarding what we mean by quality (although you may wish to reserve this for the lesson on quality). Alternatively, use an example where high conformance is necessary for safety reasons such as in hospital blood testing.
  - **Speed** – Any accident, emergency or rescue service is useful to discuss here. The consequences of lack of speed are immediately obvious to most students. Also, use transportation examples where different speeds are reflected in the cost of the service. First and second-class postage is an obvious example as are some of the over-night courier services. Likewise, the fast check-in service offered to business class passengers at airports and the exceptionally fast service of Concorde (depending on whether it is flying when you are reading this!), which offers a fast service at a very high price.
  - **Dependability** – Some of the best examples to use here are those where there is a fixed 'delivery' time for the product or service. Theatrical performances are an obvious example (or the preparation of lectures). Other examples include space exploration projects, which rely on launch dates during a narrow astronomical 'window'.
  - **Flexibility** – We have found the best examples here to be those where the operation does not know who or what will 'walk through the door' next. The obvious example would be a bespoke tailor who has to be sufficiently flexible to cope with different shapes and sizes of customer and also (just as importantly) different aesthetic tastes and temperaments. A more serious example would be the oil exploration engineers who need to be prepared to cope with whatever geological and environmental conditions they find while drilling for oil in the most inhospitable parts of the world. Accident and emergency departments in hospitals can also provide some good discussions. Unless they have a broad range of knowledge, which allows them to be flexible, they cannot cope with the broad range of conditions presented by their patients.
  - **Cost** – We use the example of low cost retailers such as Aldi who have achieved some success in parts of Europe by restricting the variety of goods they sell and services they offer.

- **Exercise –** The alternative method of teaching performance objectives (and the one we prefer) is to find an example, which can be deconstructed using all five performance

objectives. The case exercise at the end of Chapter 2 (Operations objectives at the Penang Mutiara) is ideal for this. Not only can it provoke a debate on the external benefits of each performance objective (why the customers like each of them), but it can also demonstrate some of the internal connections between the performance objectives (for example, the way staff flexibility allows them to respond quickly to unexpected demand).

Case study teaching notes

Operations objectives at the Penang Mutiara

This case describes some aspects of the operations objectives of the Penang Mutiara Hotel, one of the most luxurious resort hotels in South-East Asia. The hotel's objectives are described through extensive quotes from the Manager of the hotel. The operations objectives of the hotel are described in the same order as they are treated in the chapter, namely, quality, speed, dependability, flexibility and cost. Examples are given of what each of these objectives means to the hotel.

Some notes on the Penang Mutiara case study

This exercise is best used as an introductory exercise towards the beginning of any operations management course. It is a 'soft' exercise in that many of the issues are in the form of opinion (albeit by the chief operations managers of the hotel) and students are probably sufficiently familiar with hotels (if not necessarily of the same class) to speculate. Although the questions to the case exercise refer to operation's role in corporate strategy and the Hayes and Wheelwright Stage 1 to 4 model, the intended use of the case exercise is to give the students practice in identifying the five performance objectives. It is important for them to recognize that there are several dimensions to quality, as well as to the other performance objectives. Asking them to identify what each of the five performance objectives actually means to an operation such as this helps them to understand their multi-dimensional nature.

The exercise may also be extended by asking the students to identify what the various activities of the operations management mean at an operation such as this. For example:

What are the design decisions, which the hotel's operations managers must make?

What do planning and control mean in an operation such as this?

How might an operation such as this improve its performance levels?

1. Is the hotel's operations management appropriate for its strategy?

The key question here is 'how does the hotel compete?' After which one should ask, 'do our operations support this way of competing?'

Hotels such as the Penang Mutiara compete on a global scale against other resort hotels around the world. The Mutiara is at the 'up-market' end of this business, offering high levels of comfort to its guests. Quality of service therefore must be of a high standard although some aspects of quality, such as cleanliness and the state of repair of the furniture and fittings, will be expected to be acceptable by guests and only noticed if they are not acceptable. Other aspects of quality, such as the standard of the food and the level of personal attention, should clearly identify the hotel in the luxury end of the market.

Can the hotel implement changes in strategy?

Changes in strategy for the hotel might include things such as the following:

- Moving into the off-season conference market (requiring the operation to offer different types of service package to different guests).

- Linking with other South-East Asian luxury hotels to offer multi-location holidays (requiring the operation to coordinate its reservation system with other hotels and tour operators).

- Extending its services to provide specialist sports and activity holidays (requiring the operation to broaden its range of activities to include specialist instructors and equipment, medical services, etc.).

The hotel's main concern (as with any manager of high customer contact operations) will be how to implement such changes so that:

(a) on-going operations are not disrupted and customers inconvenienced;

(b) there are no problems, even at the start of the new services, so customers are well served, even those who are (unwittingly) 'guinea pigs' for the new service.

2. Where is the Penang Mutiara on the Stage 1–4 scale?

- Stage 1 – If the manager is to be believed, the Mutiara's standard of operations performance is certainly not holding the operation back from competing effectively.

- Stage 2 – It is not merely trying to raise its standards of service to those practised in the best resort hotels. Its standards seem to be what one would expect from the best hotels in its class.

- Stage 3 – Is the hotel up to the standard of the best in the world? It is difficult to tell from one person's (the manager's!) view, but it sounds from the case as though it is.

- Stage 4 – Is the operation actually driving the competitive strategy of the organization? Again, it is difficult to tell, but if it were it would mean that the excellence of its service and innovation shown by its operations were changing the expectations of customers.

3. The Mutiara's external objectives.

Quality of service at the hotel will include aspects such as the following:

- Appearance of fixtures and fittings.

- Cleanliness of the hotel.

- Courtesy and expertise of staff.

- Appearance and taste of food.

- Complimentary 'extras' in rooms.

Speed means aspects such as the following:

- Reporting back to guests on the progress of requests.

- Regular and predictable cleaning times.
- Regular supply of linen, room-extras, and so on.
- Meals and entertainment happen as advertized.

Flexibility means aspects such as the following:

- Introduction of new services in the hotel.
- Meeting a wide (but defined) range of customer requests.
- Changing the number of staff allocated to particular tasks.
- Adjusting the timing of activities (e.g. room cleaning) to meet customer requests.

Cost. Much of the cost base of the hotel will be fixed; the cost of staff is largely constant in as much as in the short to medium term . In the longer term, the costs of the building and facilities and their maintenance and upkeep are also difficult to reduce. For this reason, the utilization of the hotel's resources (the 'occupancy' of the hotel) will be a key determinant of profitability. This is why the hotel's operation has such a significant contribution to make in ensuring that the quality of service it provides encourages customers to visit and return to the hotel.

Internal interactions between performance objectives

The interesting relationships particularly brought out in the case were those between flexibility and quality (responding to a guest's needs when something goes wrong) and speed (moving staff around to respond to changes in demand for services). In addition, flexibility, in terms of responding quickly to, say, a staff shortage in room cleaning, could also help keep the cleaning task on schedule and hence dependable. Flexibility could also keep staff utilization high by moving them to where they will be fully and usefully occupied. This maintains staff productivity and hence keeps costs low. Flexibility seems to play a central role in 'enabling' the other performance objectives.

Model answers to short cases

Organically good quality

1. What does Lower Hurst Farm have to get right to keep the quality of its products and services so high?

It is first important to understand what is meant by 'quality' in this case. Of course, it means the same as for any other product, namely, that it consistently meets its specification. But also there are other issues with this organization. First, there is a matter of trust. The people who buy this meat are doing so, at least partly, because it is organic. Therefore, they must trust the operation to maintain everything that is associated with organic farming. This includes both the way the animals are reared and cared for and the stewardship of the countryside. The operation therefore must do everything it can to demonstrate that it is doing this and build the trust of its customers. Second, there is a significant 'quality of service' issue. Catherine points out that customers like to have personal communication with her when they are ordering their meat. Quality of service therefore means not only the courtesy and responsiveness that we would expect from any service, but also the feeling that the customers are 'part of the system'.

Achieving these different aspects of quality means devoting considerable attention to how the farm manages its processes. In effect, there are three processes here, rearing the cattle, butchering the cattle and packing the meat and order taking and despatch to customers. Rearing the cattle under organic conditions is clearly a rigorous and a demanding process. The inputs to the process (the land, cattle, feed, absence of artificial fertilizers and drugs etc.) must all be checked for quality and the day-to-day care of the cattle must conform to organic farming rules. The butchering must be done so as not to cause too much distress to the animals and the freezing process is designed (with specialist help) to maintain the quality of the meat. Finally, the ordering process must be conducted, not just with courtesy, but also with a level of friendliness appropriate to customers' expectations. Similarly, transportation of the products must be fast and dependable (Catherine always calls customers to make sure that they have received their order and that it is in good condition).

2. Why is Nick's point about veterinarian help important for all types of operation?

Nick distinguishes between how most farmers use veterinarian help (as an emergency service) as opposed to how organic farmers use it (as a method for preventing problems happening in the first place). This issue applies to almost all operations. It is treated in detail in Chapter 19 where we distinguish between preventive maintenance and 'run to breakdown' maintenance. Nick's view is very close to the modern philosophy that, because the true cost of breakdown in any part of an operation is far higher than most people imagine because of the disruption it causes, it is usually best to try to put some effort into preventing breakdowns happening in the first place.

When speed means life or death

1. Draw a chart, which illustrates the stages between an accident occurring and full treatment being made available.

We do not have enough information to draw any definitive chart.

2. What are the key issues (both those mentioned above and any others you can think of), which determine the time taken at each stage?

Looking at the list of activities above, one can see that minimizing the time between each one depends on a number of factors.

- Information flow – The faster the information moves between the three parties (the victim, the vehicle with its staff and the hospital) the faster decision processes can start. Automated systems of accident notification, such as that described in the box, are useful but more common means such as the advent of widespread mobile phone ownership will help reduce information-transmission times.
- Decision making – Although partly dependent on the quality of information provided, it is important that all staff are trained to make decisions (in this case usually diagnostic decisions) as quickly as possible. Training will need to be designed to promote fast and accurate diagnostic decision making.
- Skills availability – This is related to the above point; if the necessary skills that are available in the diagnosis and treatment in the vehicle can be speeded up. At its extreme, this would involve a full medical team and all equipment being carried on board the vehicle, which is clearly impractical. However, the decision on what skills to have aboard the vehicle (there are doctors carried on the helicopter) and what equipment to have on board (a trade-off between weight and availability of equipment on the helicopter) are key issues.

- Journey times – The location of hospitals in heavy accident areas can reduce journey times. Probably the most significant move of recent years is to position ambulances away from their home base and near potential accident zones, as mentioned in the box (it's a lot cheaper than moving hospitals).
- Capacity management – The problem with accidents is that they cannot be planned in advance. Some times are known for being dangerous (a rainy Friday evening when people are returning home from work, for example). But there will always be some element of uncertainty. Providing plenty of resources during such emergencies minimizes the chance that ambulances, doctors and so on will be busy, but this will obviously be expensive. To some extent this decision will always come down to how much, as a society, we are willing to pay to minimize accident trauma.

Taxi Stockholm

1. How can Taxi Stockholm keep its dependability high during those times when demand is high and traffic is congested?

Taxi Stockholm seem to use two methods of keeping their dependability high. First, they ensure a high level of communication with the customer through their call centre. They deliberately do not emphasize productivity so that call centre operatives can keep the customer informed regarding the level of service they should expect to receive (for example, how long they will have to wait for a taxi). This also allows call centre operators to manage customers' expectations. Remember it is not speed that they are competing on but dependability. It is more important to Taxi Stockholm that, even if the taxi will not arrive for half an hour, it really does arrive within half an hour. The second method they use is some very advanced technology. Taxi Stockholm are known for their investment in state-of-the-art identification, positioning and automatic routing technology. Again, this enables the operation to obtain accurate information that helps it to make reasonable estimates of time of arrival and journey times.

Flexibility and dependability in the newsroom

1. What do the five performance objectives mean for an operation such as the BBC's newsroom?

- Quality – primarily means that the news report is fair and accurate but also means that video downloads and link ups and so on work seamlessly.
- Speed – means that a journalist can cover any 'breaking' news quickly and his or her report is transmitted back to the newsroom quickly.
- Dependability – means that the news bulletin can go out on time. Most television stations programme their news at set times of day. Being late is not an option.
- Flexibility – means being able to hold several news stories together with video reports and make the decision about which to include and in what order as late as possible.
- Cost – means being able to do all the above without an army of news reporters, camera operators, presenters, studio technicians and so on.

2. How do these performance objectives influence each other?

They are all related to some extent but the relationship, which is highlighted in the box is that between flexibility and dependability (with some quality thrown in). In effect the argument being made is that the latest video handling technology enables the most appropriate mix of stories (highest quality programme) to be broadcast with absolute dependability.

Everyday low prices at Aldi

1. What are the main ways in which Aldi operations try to minimize their costs?

Aldi performs two sets of complementary things to keep their costs down; they minimize input costs and they reduce process complexity.

Minimizing input costs includes specializing in 'private label', that is Aldi branded products. This means that they can specify the composition (for example, recipe) of products to keep costs under control. They do not have to support the brand marketing that is necessary with branded products. They are also a large organization who can order products in very large quantities thereby keeping prices down. They do not use complex and costly fittings in their stores. Using 'open carton' displays and deliberately not supplying grocery bags both eliminate costs that other supermarkets incur.

The system is also simple. An ordering and stock management system that only has to cope with 700 items is much easier to design and operate than one, which has to cope with 30,000 items. Supply chain, stock movement, quality management and other systems are therefore simpler and cheaper. By using simple customer management devices such as the returnable deposit only when a cart is brought back to the store, the job of collecting and returning trolleys is eliminated.

Being cheap is our speciality

1. Identify the various ways in which Hon Hai has kept its costs low.

Four factors that have a significant impact on operations cost are mentioned in the short case.

(a) It does not spend money on unnecessary overheads – unimposing corporate headquarters and so on.

(b) Economies of scale – its low prices have brought in more business, which increases the volume of output of its factories, which in turn reduces the unit cost of producing its products.

(c) Economies of scale – the company makes many of its own components, presumably because it can do so cheaper than it could buy them from suppliers. In other words, it is retaining the profits from component manufacture itself.

(d) It makes in low cost locations such as China.

2. How easy will it be for Hon Hai's competitors to copy the way it has kept its costs low?

In principle, there is nothing to stop Hon Hai's competitors adopting exactly the same policies. In fact, many competitors are doing exactly the same thing. However, remember that Hon Hai has the advantage of doing all these things before many of its competitors even thought about them. When any company tries something new, it will have to learn how to make its strategy work effectively. Hon Hai has more experience of this than its competitors. Nevertheless, it will have to maintain its level of organizational and process-learning if it is to stay ahead.

It is also important to note that the cost efficiencies that come from operations- and process-excellence within the firm are far more difficult to copy than those that derive from simply reducing input costs. For example, Hon Hai gains significant cost advantage from producing in China, but eventually all its competitors will be doing this.

CHAPTER 3

Operations strategy

Teaching guide

Introduction

Think carefully before even including this chapter in your course. Clearly it is a vitally important issue for any practising operations manager, but sometimes undergraduates can be confused by the distinction between operations strategy and operations management. The PowerPoint slides for this chapter do include a couple, which help to explain the difference, but it can still be confusing. This is partly because there is not such a clear separation between operations management and operations strategy as we sometimes imply. In the operations area especially, we need to include the accumulated learning, which comes from day-to-day management of operations resources. This is why the fourth edition includes both the bottom-up perspective and the operations resource perspective. Notwithstanding the difficulties, if it is decided to include a session on operations strategy (usually towards the beginning of the course) we have found it best to treat it as a 'backdrop' to the main thrust of the course.

Key teaching objectives

- To convince students that operations management is not always 'operational'. Although most of the book does deal with the more operational aspects of the operations function's activities, operations managers have a very significant strategic role to play.

- To explain that there really is something very important embedded within operations processes. The skills of people within the operation and the processes they operate are the repository of (often years of) accumulated experience and learning.

- To give examples of how markets and operations must be connected in some way. Whether this is operations being developed to support markets, or markets being sought, which allow operations capabilities to be leveraged, does not matter. The important issue is that there should always be a connection between the two.

Exercises/discussion points

- **Teaching tip** – Try establishing the market-operations link by referring to organizations familiar to the students. Even the ubiquitous McDonald's can be used (in fact there is a very good case on McDonald's operations in the Harvard Business School series, contact The Case Clearing House for details). The important issue, however, is to raise the focus of discussion from managing a single part of the organization (such as a single McDonald's store) to managing the operations for the whole of the organization (for example, what are the key operations strategy decisions for McDonald's in the whole of Europe?). The discussion can then focus on the difference between the two levels of analysis. Especially,

discussion can look at how the operational day-to-day issues (such as, the way staff are scheduled to work at different times in McDonald's stores) can affect the more strategic issues for the organization as a whole (such as, what levels of service and costs are McDonald's franchise holders expected to work to?).

- **Exercise –** One method of establishing the connection between markets and operations is to ask the class members to find a business-to-consumer website, formally list the 'marketing' promises which the website makes and then think about the operations implications of these promises. For example, what will the company have to do in terms of its inventory management, warehouse locations, relationships with suppliers, transportation, capacity management and so on to fulfil its promises?

Case study teaching notes

Long Ridge Gliding Club

1 Evaluate the service to club members and casual flyers by completing a table similar to Table 3.1.

The needs and expectations of the club members are really quite different from those of the casual flyers. The former are enthusiasts who want to develop their skills in the sport, whereas the casuals tend to be one time thrill seekers. Club members just get on with the job and know what to do, whereas the casuals need customer service – friendliness, attention, explanation and reassurance.

The trial flights are sold as a loss leader so they can be considered to generate marginal income and profit, with all fixed costs (winches, instructors, clubhouse, office, hangar, gliders, staff, etc.) allocated to member flights. Indeed, these casual flights compensate for the overall loss the club makes on its operations. Its income from trial flights (about £21,000 pa) results in the club making a small annual profit of around £10,000. Despite expecting to attract new members through trial flights, less than 5 in 750 (0.7%) result in new members.

Casual members choose gliding because it is available. They might consider hot air ballooning too, for example, if it were available nearby. Price is also important. Since many flights are bought as presents, too high a price would put many off, the current cheap rate (compared to hot air ballooning, for example, at nearly £80 per person) results in many sales. For the enthusiasts the club needs to be within a reasonable travelling distance so they can fly regularly without too much difficulty, so location is critical. Members are concerned about the price of membership and being able to turn up whenever they want. The table below summarizes the differences between the casual flyers and the club members.

	Club members	*Casual flyers*
Product	Provision of facilities and instruction to pursue the sport	To experience gliding
Customers	Enthusiasts	Thrill seekers
Product range	Novice to competition gliding	Short introductory flights
Design changes	None	Variety of packages
Delivery	Club/team activity – co-producer of product	Dependable flight

Quality	Good flying conditions	Support, care and attention
Volume per service type	300 members	750 trial flights
Profit margins	Negligible	Mostly profit

Competitive factors		
Order winners	Location	Price Availability
Qualifiers	Price Flexibility Dependability	Range of products Quality of service Location
Less important		

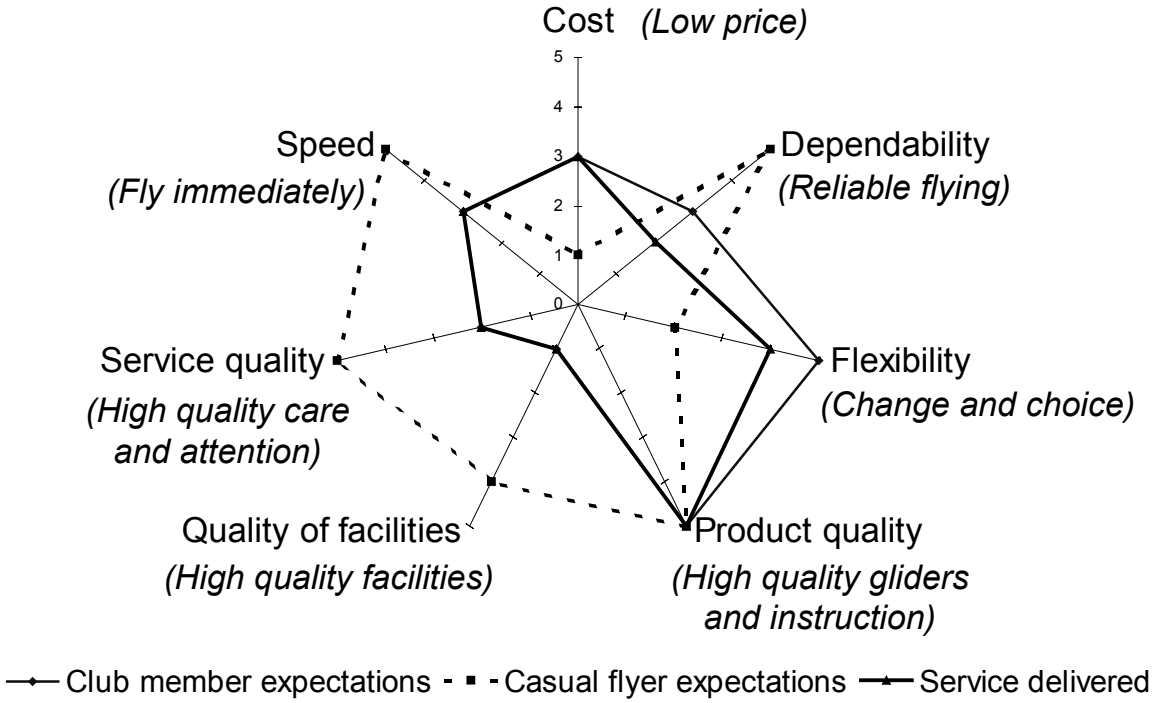
Internal performance objectives	Cost Flexibility Dependability	Speed Dependability Flexibility Quality

2. Chart the five performance objectives to show the differing expectations of club members and casual flyers and compare these with the actual service delivered.

Students will provide a wide range of polar diagrams. This example can be used to demonstrate the need to try to be scientific by devising scales along which agreement about the five performance objectives can be assessed. The tables below show possible scales, their ratings and the resultant polar diagram not only for each customer type but also against the service delivered. ('Quality' refers to product quality, i.e. the gliders and the quality of instruction, the quality of facilities and the quality of service – quality of the pre- and post-flight care).

	0	5
Cost	High price	Low price
Dependability	Not likely to be able to fly	Able to fly as arranged
Flexibility	Single product	Do anything anytime
Product quality	Dangerous gliders and poor instruction	Well maintained gliders and excellent instruction
Quality of facilities	Very basic facilities	5 star facilities
Service quality	Non-existent service	Helpful, attentive and available staff
Speed	Wait all day	Fly immediately

	Club member expectation	*Casual flyer expectations*	*Service delivered*
Cost	*3*	1	3
Dependability	3	5	2
Flexibility	5	2	4
Product quality	5	5	5
Quality of facilities	1	4	1
Service quality	2	5	2
Speed	3	5	3



It is clear that the operation (i.e. the service delivered) is more attuned to the needs of the club members. This should be of no surprise because club members run the operation (through the committee).

Indeed many club members see the casuals as a nuisance who take up their precious airtime and reduce instructor availability with little benefit to the club.

- Club members are expected to help for a full day at the club, whereas members of the public are not required to help at all.