

Operations and Process Management (5th Edition)

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Q&As to ‘applying the principles’



CHAPTER 1

Operations and processes

Question 1

Quentin Cakes make about 20,000 cakes per year in two sizes, both based on the same recipe. Sales peak at Christmas time when demand is about 50 per cent higher than in the more quiet summer period. Their customers (the stores who stock their products) order their cakes in advance through a simple internet-based ordering system. Knowing that they have some surplus capacity, one of their customers has approached them with two potential new orders.

The *Custom Cake* Option – this would involve making cakes in different sizes where consumers could specify a message or greeting to be ‘iced’ on top of the cake. The consumer would give the inscription to the store who would e-mail it through to the factory. The customer thought that demand would be around 1,000 cakes per year, mostly at celebration times such as Valentine’s Day and Christmas.

The *Individual Cake* Option – this option involves Quentin Cakes introducing a new line of about 10–15 types of very small cakes intended for individual consumption. Demand for this individual-sized cake was forecast to be around 4,000 per year, with demand likely to be more evenly distributed throughout the year than their existing products.

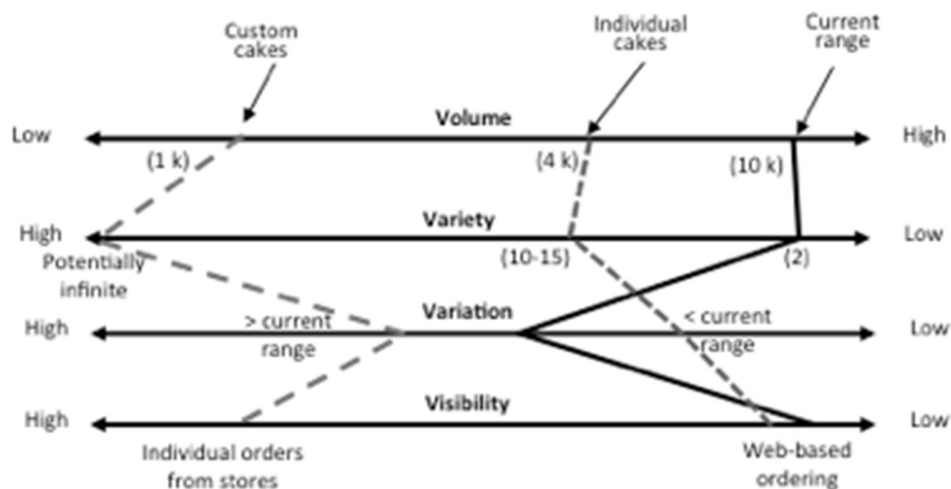
The total revenue from both options is likely to be roughly the same and the company has only capacity to adopt one of the ideas. Which one should it be?

Question 1 – Analysis

This question involves comparing the existing product range of Quentin Cakes with the two proposed extensions to their (currently limited) range. Given that the revenue from each of the options is roughly the same, the most profitable option is likely to be the one with the lowest cost. And in the absence of any detailed cost data, the best way to gain an estimate of costs is to look at the position of each option on the ‘4Vs’ and compare them with the existing range of cakes. The figure below shows this analysis.

	Current range	Custom cakes	Individual cakes
Volume	About 20,000 cakes per year	Around 1,000 cakes per year	Around 4,000 per year
Variety	Two sizes	Every cake is different	About 10–15 types
Variation	Peak to trough of 50%	Likely to be higher	Likely to be lower
Visibility	Remote web-based ordering from stores	Would need more communication between stores and factory	Probably remote web-based ordering from stores

4 V's analysis for Quentin Cakes



Given that, other things being equal, the further to the right on the 4Vs chart an option is, the lower cost it is likely to be, then 'individual cakes' will be less costly to produce than 'custom cakes'. So, unless there are other reasons (such as a shift in the company's overall strategy), the 'individual cakes' option seems preferable.

Question 2

Described as having 'revolutionised the concept of sandwich making and eating', Prêt A Manger opened their first shop in the mid-1980s, in London. Now they have over 130 shops in UK, New York, Hong Kong and Tokyo. They say that their secret is to focus continually on quality, in all its activities. *'Many food retailers focus on extending the shelf life of their food, but that's of no interest to us. We maintain our edge by selling food that simply can't be beaten for freshness. At the end of the day, we give whatever we haven't sold to charity to help feed those who would otherwise go hungry.'* The first Prêt A Manger shop had its own kitchen where fresh ingredients were delivered first thing every morning, and food was prepared throughout the day. Every Prêt shop since has followed this model. The team members serving on the tills at lunchtime will have been making sandwiches in the kitchen that morning. They rejected the idea of a huge centralised sandwich factory even though it could significantly reduce costs. Prêt also own and manage all their shops directly so that they can ensure consistently high standards. *'We are determined never to forget that our hardworking people make all the difference. They are our heart and soul. When they care, our business is sound. If they cease to care, our business goes down the drain. We work hard at building great teams. We take our reward schemes and career opportunities very seriously. We don't work nights (generally), we wear jeans, we party!'*

- Do you think Prêt A Manger fully understand the importance of their operations management?
- What evidence is there for this?
- What kind of operations management activities at Prêt A Manger might come under the four headings of direct, design, deliver and develop?

Question 2 – Analysis

If you do not have access to a local Prêt A Manger, you might find it useful to visit their website 'about us' section (<http://www.pret.co.uk/en-gb/about-pret>). From this, and other public available sources, you should be able to find out the following:

(a) Do you think Prêt A Manger fully understand the importance of their operations management? and (b) What evidence is there for this?

The whole of Prêt A Manger's rationale is based on an understanding of **how they organise their resources to deliver their service**. And that is what operations management is all about. When the operation was founded it, '*revolutionised the concept of sandwich making and eating*', designing and running their operations to deliver a different (high-quality) service.

(c) What kind of operations management activities at Prêt A Manger might come under the four headings of direct, design, deliver and develop?

This is not an exhaustive list, and is a bit speculative, but typical operations-related decisions could include the following:

Direct	Design	Deliver	Develop
Competitive priorities (quality, freshness, product innovation, social responsibility) Store location Store capacity Operating structure (no central kitchen)	Store layout and design Customer flow pattern Human resource policies	Store staffing levels Opening times Ingredient ordering levels Inventory levels (low because of freshness policy) Supplier selection and liaison	Quality of service standards Quality monitoring (they use 'mystery shopper' systems) Reward schemes

Question 3

Visit an IKEA superstore and a smaller furniture store. Observe how the shop operates, for example, where customers go, how staff interact with them, how big it is, how the shop has chosen to use its space, what variety of products it offers and so on. Talk with the staff and managers if you can. Think about how the two shops differ from each other. Then consider the question, '*What implications do the differences between IKEA and the smaller shop have for their operations management?*'

Question 3 – Analysis

IKEA is the most successful furniture retailer ever. With stores all over the world, they have managed to develop their own special way of selling furniture. Their stores' layout means customers often spend two hours in the store – far longer than in rival furniture retailers. IKEA's philosophy goes back to the original business, started in the 1950s in Sweden by Ingvar Kamprad. He built a showroom on the outskirts of Stockholm where land was cheap and simply set the furniture out as it would be in a domestic setting. Also, instead of moving the furniture

from the warehouse to the showroom area, he asked customers themselves to pick the furniture up from the warehouse – still the basis of IKEA's process today.

Note how ordered the flow of customers is in an IKEA store. The stores are all designed to facilitate the smooth flow of customers, from parking, moving through the store itself, to ordering and picking up goods. At the entrance to each store large notice boards provide advice to shoppers who have not used the store before. For young children, there is a supervised children's play area, a small cinema, a parent and baby room and toilets, so parents can leave their children in the supervised play area for a time. Parents are recalled via the loudspeaker system if the child has any problems. IKEA 'allow customers to make up their minds in their own time' but 'information points' have staff who can help. All furniture carries a ticket with a code number which indicates its location in the warehouse. (For larger items customers go to the information desks for assistance). There is also an area where smaller items are displayed, and can be picked directly. Customers then pass through the warehouse where they pick up the items viewed in the showroom. Finally, customers pay at the checkouts, where a ramped conveyor belt moves purchases up to the checkout staff. The exit area has service points, and a loading area that allows customers to bring their cars from the car park and load their purchases.

Comparing the two types of retail operation:

Service factor	IKEA	Smaller retailer
Variety of goods	Very high	Almost certainly far lower
Quality of goods	Adequate	Variable depending on market position of store
Waiting time for 'delivery'	Immediate (if in stock)	Almost certainly longer, probably weeks
Quality of advice	Focused where it is needed (e.g. kitchen units)	Variable, but probably high
General level of service	Relatively low, relatively few staff given volume of business	Variable, but probably high
Degree of self-service	Very high – customer picks goods from warehouse	Probably none
Time spent queuing in-store	Very high at peak times	Varies, but almost certainly less than IKEA
Entertainment value of store visit	Unless you are a real furniture freak, very little	Believe it or not, IKEA is seen by some as a 'good day out'
Prices/value	Very good	Probably more expensive than IKEA

Question 4

Write down five services that you have 'consumed' in the last week. Try and make these as varied as possible. Examples could include public transport, a bank, any shop or supermarket, attendance at an education course, a cinema, a restaurant and so on.

For each of these services, ask yourself the following questions:

- Did the service meet your expectations? If so what did the management of the service have to do well in order to satisfy your expectations? If not, where did they fail? Why might they have failed?
- If you were in charge of managing the delivery of these services what would you do to improve the service?
- If they wanted to, how could the service be delivered at a lower cost so that the service could reduce its prices?
- How do you think that the service copes when something goes wrong (such as a piece of technology breaking down)?
- Which other organisations might supply the service with products and services? (In other words, they are your 'supplier', but who are *their* suppliers?)
- How do you think the service copes with fluctuation of demand over the day, week, month or year?

These questions are just some of the issues that the operations managers in these services have to deal with. Think about the other issues they will have to manage in order to deliver the service effectively.

Question 4 – Analysis

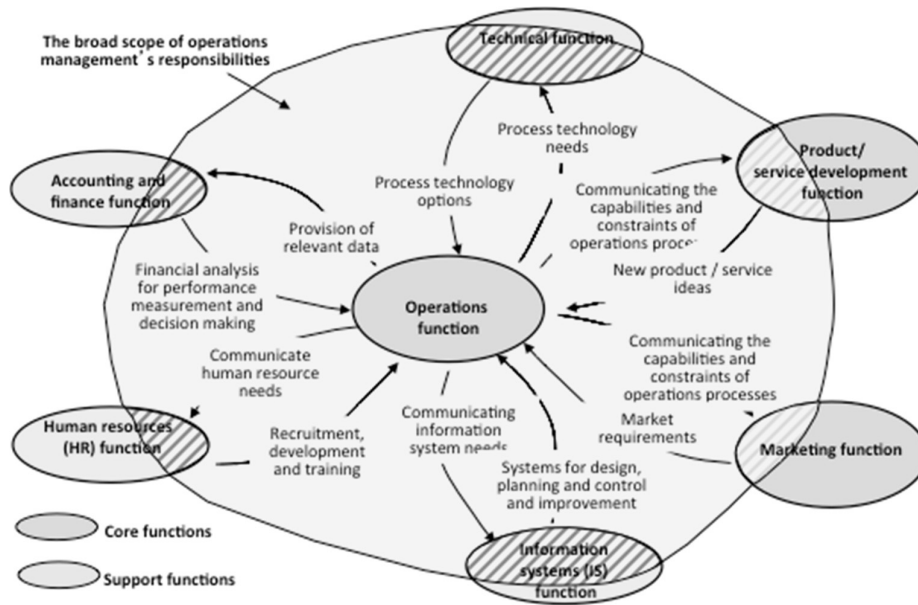
With this question, try to make the services that you think about as varied as possible. The main purpose of the question is to prepare for the topics later in the book, however also try to focus on the differences between the services and the implications of those differences for their operations managers.

Question 5

Find a copy of a financial newspaper (*Financial Times*, *Wall Street Journal*, *Economist*, etc.) and identify one company that is described in the paper that day. What do you think would be the main operations issues for that company?

Question 5 – Analysis

Again, very much a 'thought provoking' question. Use the opportunity to think about the relationship between the operations function of whatever company is being discussed and the other functions of the company. The following diagram might help.



CHAPTER 2

Operations and strategic impact

Question 1

The environmental services department of a city has two recycling services – newspaper collection (NC) and general recycling (GR). The NC service is a door-to-door collection service that, at a fixed time every week, collects old newspapers that householders have placed in reusable plastic bags at their gate. An empty bag is left for the householders to use for the next collection. The value of the newspapers collected is relatively small; the service is offered mainly for reasons of environmental responsibility. By contrast the GR service is more commercial. Companies and private individuals can request a collection of materials to be disposed of, either using the telephone or the internet. The GR service guarantees to collect the material within 24 hours unless the customer prefers to specify a more convenient time. Any kind of material can be collected and a charge is made depending on the volume of material. This service makes a small profit because the revenue both from customer charges and from some of the more valuable recycled materials exceeds the operation's running costs. How would you describe the differences between the performance objectives of the two services?

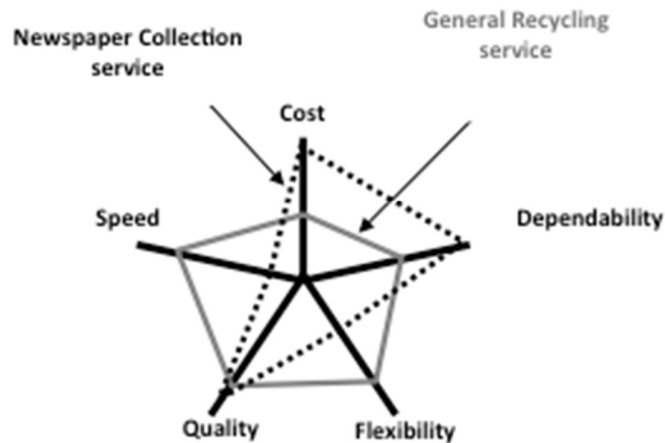
Question 1 – Analysis

The two services are very different in terms of the relative importance of their performance objectives. The table below illustrates this.

Performance objective	Newspaper collection (NC)	General recycling (GR)
Quality	<i>Must leave empty bag for the householders to use for the next collection</i>	<i>Telephone or the internet interface important</i>
Speed	<i>Dependability more important</i>	<i>Guarantees to collect the material within 24 hours unless the customer prefers to specify a more convenient time</i>
Dependability	<i>Collects old newspapers at a fixed time every week,</i>	
Flexibility	<i>Only newspapers in standard bag, therefore little flexibility needed</i>	<i>Any kind of material can be collected and a charge is made depending on the volume of material</i>
Cost	<i>Small profit so cost control important</i>	<i>Service is more commercial, presumably can charge more therefore cost (never unimportant) but less of an issue</i>

Or, to use the polar diagram.

Polar diagrams for Newspaper Collection (NC) and General Recycling (GR) services



Question 2

The Managing Partner of The Branding Partnership (TBP) describes her business. *‘It is about four years now since we specialized in the small to medium firms’ market. Before that we also used to provide brand consultancy services for anyone who walked in the door. So now we have built up our brand consultancy skills in many areas. However, within the firm, I think we could focus our activities even more. There seem to be two types of assignment that we are given. About forty per cent of our work is relatively routine. Typically these assignments are conventional market research and focus group exercises. Both these activities involve a relatively standard set of steps that can be carried out by relatively junior staff. Of course, an experienced consultant is needed to make some decisions, however most of this work is fairly routine. Customers expect us to be relatively inexpensive and fast in delivering the service. Nor do they expect us to make simple errors; in fact if we did this too often we would lose business. Fortunately our customers know that they are buying a “standard package” and don’t expect it to be too customized. The problem here is that specialist agencies have been emerging over the last few years and they are starting to undercut us on price. Yet I still feel that we can operate profitably in this market and anyway, we still need these capabilities to serve our other clients. The other sixty per cent of our work is for clients who require far more specialist services, such as assignments involving major brand reshaping. These assignments are complex, large, take longer, and require significant branding skill and judgment. It is vital that clients respect and trust the advice we give them in all “brand associated” areas such as product development, promotion, pricing and so on. Of course they assume that we will not be slow or unreliable in preparing advice, but mainly it’s trust in our judgment backed up by hard statistics that is important to the client. This is popular work with our staff. It is both interesting and very profitable.’* How different are the two types of business described by the Managing Partner of TBP? It has been proposed that she split the firm into two separate business; one to deal with routine services and the other to deal with more complex services. What would be the advantages and disadvantages of doing this?

Question 2 – Analysis

Again, this is the common operations strategy issue of whether different market requirements warrant different internal operations. In other words, should market segmentation be matched by internal operations segmentation?

First, it is always useful to try and understand the differences between the operation's various offerings (2 in this case) and the implications. The table below illustrates.

	Routine market research	Complex branding exercises
Volume	(Implied high)	Lower
Variety	Some commonality between the needs of clients	Every assignment is different
Margin	(Implied low)	(Implied high)
Order-winners	Cost Speed	Quality (of advice) Flexibility (of skills)
Qualifiers	Quality (errors)	Speed Dependability

So, at least as far as one can tell, the two types of offerings, although both concerned with the same knowledge base, compete in very different ways. But does this mean that the business should be split in two? Advantages and disadvantages could include the following:

Advantages of splitting the business into two separate operations	Disadvantages of splitting the business into two separate operations
<ul style="list-style-type: none"> Each operation can focus on what the different offerings need to compete effectively (see the discussion of trade-offs in the chapter) Can get a better idea of the true profitability of each type of service 	<ul style="list-style-type: none"> Reduces overall volume of business in each part of the business, so more difficult to cover the fixed costs of the business Created two classes of staff. Those trusted with only simple/routine stuff, and those who can tackle more difficult assignments. So less chance of staff development and promotion possibilities. Precludes learning from one service and transferring that knowledge to the other.

Question 3

DSD designs, makes and supplies medical equipment to hospitals and clinics. Its success was based on their research and development culture. Although around 50 per cent of manufacturing was done in-house, their products were relatively highly priced, but customers were willing to pay for their technical excellence and willingness to customise equipment. Around 70 per cent of all orders involved some form of customisation from standard 'base models'. Manufacturing could take three months from receiving the specification to completing assembly, but customers were more interested in equipment being delivered on time rather than immediate availability. According to their CEO, *'manufacturing is really a large laboratory. The laboratory-like culture helps us to maintain our superiority in leading edge product technology and customization. It also means that we can call upon our technicians to pull out all the stops in*

order to maintain delivery promises. However, I'm not sure how manufacturing, or indeed the rest of the company, will deal with the new markets and products which we are getting into.'

The new products were 'small black box' products that the company had developed. These were devices that could be attached to patients, or implanted. They took advantage of sophisticated electronics and could be promoted directly to consumers as well as to hospitals and clinics. The CEO knew their significance. *'Although expensive, we have to persuade health care and insurance companies to encourage these new devices. More problematic is our ability to cope with these new products and new markets. We are moving towards being a consumer company, making and delivering a higher volume of more standardized products where the underlying technology is changing fast. We must become faster in our product development. Also, for the first time, we need some kind of logistics capability. I'm not sure whether we should deliver products ourselves or subcontract this. Manufacturing faces a similar dilemma. On one hand it is important to maintain control over production to ensure high quality and reliability, on the other hand, investing in the process technology to make the products will be very expensive. There are subcontractors who could manufacture the products, they have experience in this kind of manufacturing but not in maintaining the levels of quality we will require. We will also have to develop a "demand fulfillment" capability to deliver products at short notice. It is unlikely that customers would be willing to wait the three months our current customers tolerate. Nor are we sure of how demand might grow. I'm confident that growth will be fast but we will have to have sufficient capacity in place not to disappoint our new customers. We must develop a clear understanding of the new capabilities that we will have to develop if we are to take advantage of this wonderful market opportunity.'*

What advice would you give DSD? Consider the operational implication of entering this new market.

Question 3 – Analysis

This question illustrates an operations strategy dilemma that occurs in most companies at one time or another. It treats a company that is entering a related but different market. The issue is how to think through the implications of these changes as they affect the operations resources within the company. This involves understanding how the company satisfies its current markets, understanding the requirements of the new markets and understanding the implications for the operations function of serving both markets.

The major differences between the current and new generation of products can be summarised as follows:

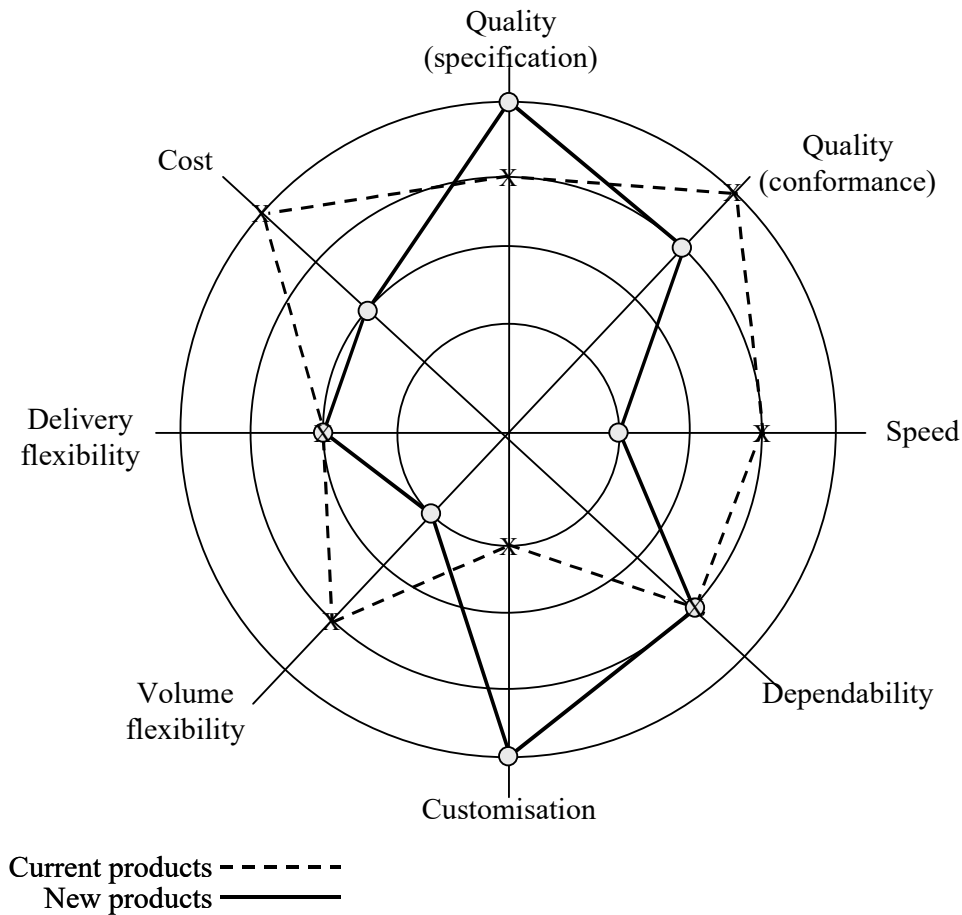
Current product range

- Multi-functional devices.
- Most delivered products are customised from a 'base' product.
- Fifty per cent of manufacturing done in-house (especially final assembly and test).
- Prices (therefore presumably margins) high but some cost pressures starting to build-up.
- Product development lead time around three years.
- Order lead time around three months.

- All manufacturing and delivery (and usually design) is 'to order.'
- Manufacturing operation is 'laboratory style.'
- Sales staff have to be technically very proficient, talk to medics on equal terms, so presumably 'relationship' is important in achieving sales.
- Long-term relationships with suppliers because of strict quality and customisation requirements.

The new range of products

- More limited and targeted functionality.
- More of a 'consumer' type of product in so much as users can be targeted directly.
- Prices are presumably considerably cheaper than current products but expensive on a per customer basis.
- Volumes higher and products more standardised than current range.
- Underlying technology changing fast so frequent product updates likely.
- New product development lead times need to be less than twelve months.
- Delivery logistics capability will be needed. Production control will be important to maintain quality and reliability levels.
- Higher volume process technologies rather than laboratory style one-off manufacture.
- New suppliers need to be developed who can maintain quality levels.
- Unsure of what will constitute an acceptable order lead time.
- Uncertain growth in demand for products but likely to be fast.



Polar diagram illustrating the relative importance of the performance objectives for the current and new products

Seen as important to meet demand, especially early in product life cycle.

From an operations perspective the differences between the market requirements for the current and new product ranges can be illustrated by examining each of the performance objectives (quality, speed, dependability, flexibility and cost). In this case though it is necessary to 'unbundle' these performance objectives slightly. It is important, for example, to distinguish between specification quality and conformance quality. Similarly, here flexibility could be split up into customisation, delivery flexibility and volume flexibility. The figure above shows the profiles of the two product groups. Note that these profiles must be considered, to some extent, approximations. They are derived from the information that is either stated explicitly or inferred in the case. In practice such an analysis would be debated with the company's management in order to discover the more subtle differences and similarities between the two product groups.

Evaluating the degree of difference between the two product ranges is an ideal opportunity to explore the operations strategy matrix, which is described in the chapter. The matrix is essentially a descriptive device. It acts almost as a checklist by prompting links and associations between the requirements of the market (stated in terms of performance objectives) and the nature of the company's operations resources.

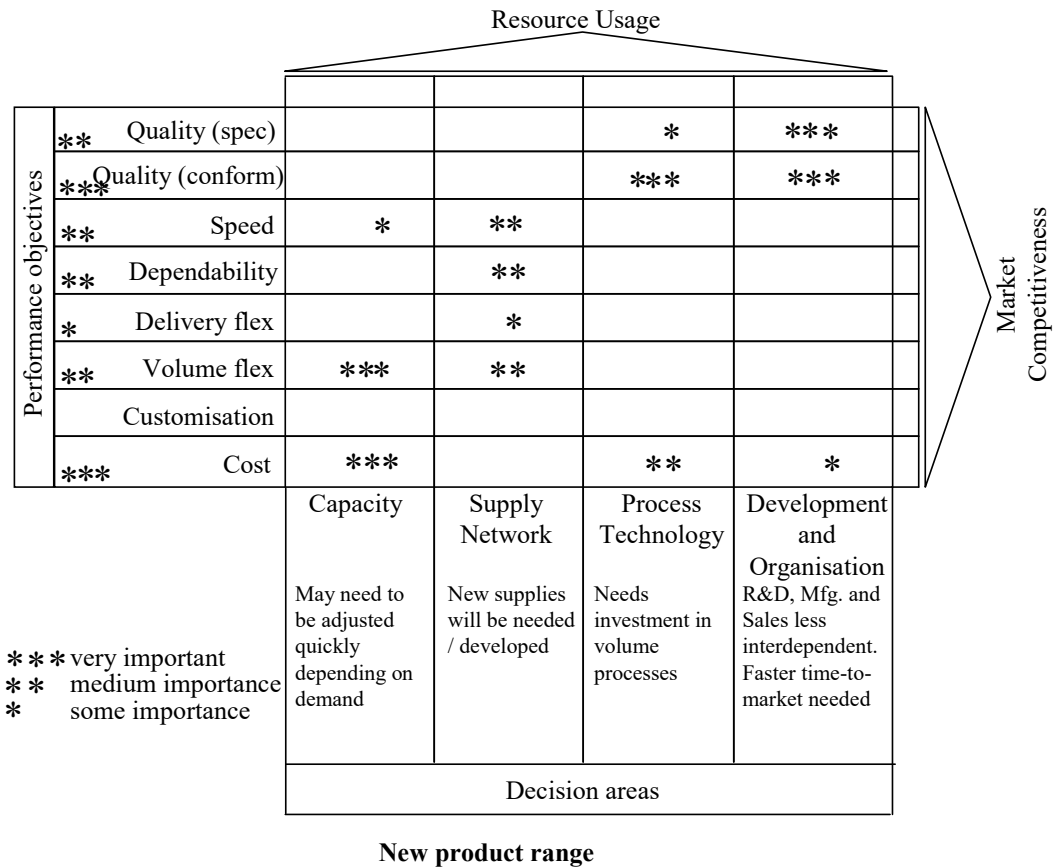
		Resource Usage				Market Competitiveness
Performance objectives	*** Quality (spec)		**	*	***	
	** Quality (conform)		*	*	**	
	Speed					
	** Dependability		*		**	
	* Delivery flex		*		*	
	Volume flex					
	*** Customisation		**	*	***	
	* Cost	*	*			
		Capacity Lab style manufacture easy to change capacity incrementally	Supply Network 50% of activities in - house	Process Technology Low process technology (but high product technology)	Development and Organisation R&D, Mfg. and Sales all share common knowledge base. Incremental new product development	
		Decision areas				

*** very important
 ** medium importance
 * some importance

Current product range

The first operations strategy matrix describes the current state of the company. Specification quality and customisation have already been identified as key market requirements. Specification quality is achieved primarily by the close liaison between research and development, sales and manufacturing, as well as the diagnostic and testing skills within manufacturing. Hence, the importance given to the intersection between development and organisation and specification quality. Development and organisation similarly affects the company's ability to customise its products. In fact this is closely related to specification quality and again provides an important intersection. Of secondary, although still significant, influence is that between the company's long-term supply partners and its ability to produce customised high-specification products. Note that speed of delivery is not seen as at all important according to the question.

The second matrix describes the fit that will be required between market requirements and operations resources for the new range of products. We have already seen on the polar diagram earlier that the two product ranges have somewhat different market requirements. Most notably conformance quality for the new product range is particularly important (devices implanted within the body are better if they keep going). Also volume flexibility, to cope with demand uncertainty, becomes important whereas customisation is not at all important. Furthermore, speed both of delivery and new product development, not currently an issue, becomes fairly important. The overall picture (again this is evident from the earlier polar diagram) is of a market where many different aspects of competitiveness are important rather than one or two key factors only. Although there is some room for debate on this, conformance quality and cost are probably particularly important aspects of market requirements.



Conformance quality, as with the old range, will be influenced by development and organisation issues such as the liaison between the different functions. In addition now, it is also influenced by the capabilities of the process technology that will need to be brought in to the manufacture of the new products. Cost, previously not an important issue, is also likely to be affected by the efficiency of the process technology, but is possibly most affected by getting capacity decisions right. Too much capacity and excess costs will occur; too little capacity and the company will not be sufficiently volume flexible to meet uncertain and/or fluctuating levels of demand.

Although it is a matter of judgement, the two operations strategy matrices do seem to be significantly different. The way in which capacity is managed, supplier networks are managed, process technology is developed and the development and organisation of the company's infrastructure are all likely to be different for the two different product ranges.

	Current product range	New product range
Capacity	The laboratory-style manufacturing set-up and the flexibility between functions imply that capacity is relatively easy to change. People, because they share a similar technical knowledge, can be moved between tasks as demand varies.	The higher volume production using process technologies with fixed capacity limits will mean that changes in output level will involve larger increments of capacity change. There is more risk of getting capacity levels wrong and greater cost consequences of doing so.
Supply network	Currently suppliers provide components while customised assembly and testing is performed in-house. Most suppliers have been with the company a long time. Presumably relationships are well developed.	A new set of suppliers will need to be contracted. The companies that supply the components for the new product range are unused to the exacting quality standards demanded by Dressing's markets.
Process technology	It seems that process technology is relatively general purpose and low tech. Laboratory-style manufacturing processes are needed to deal with the high variety implied by customisation.	The standardised nature of the new range and higher volumes mean that, to be cost efficient, automated process technologies will be needed. The company has no previous experience with such technologies.
Development and organisations	There is close relationship between the primary functions of research and development, manufacturing, and sales. All share a common technical knowledge and work together on developing base products as well as customising products for individual customers. New product development has traditionally taken up to three years!	To some extent the three functions will each have a more demanding task. If R&D gets product designs wrong then they cannot be customised to compensate for any flaws in designs. Manufacturing needs to concentrate on getting the capacity-demand balance right and keeping costs low. Sales and marketing now have to think in terms of market segmentation and promoting products to a wider range of end users. The challenge will be to keep the three functions together organisationally. Also, new product development must get considerably faster.

Question 4

Xexon7 is a specialist artificial intelligence (AI) development firm that develops algorithms for various on-line services. As part of its client services it has a small (10 person) help-desk call centre to answer client queries. Clients could contact them from anywhere in the world at any

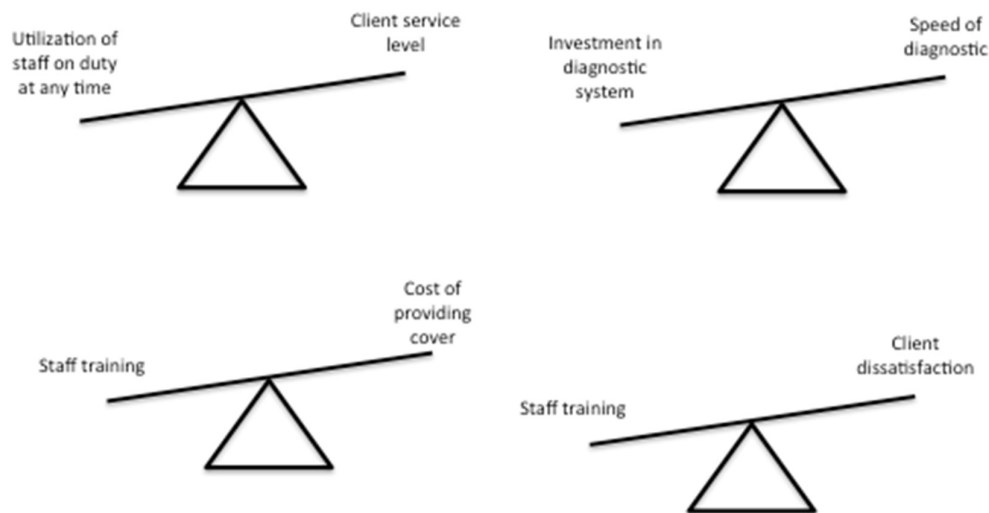
time of the day or night with a query. Demand at any point in time was fairly predictable, especially during the (European) daytime. Demand during the night hours (Asia and the Americas) was considerably lower than in the daytime and also less predictable. *'Most of the time we forecast demand pretty accurately and so we can schedule the correct number of employees to staff the work stations. There is still some risk of course. Scheduling too many staff at any point in time will waste money and increase our costs while scheduling too few will reduce the quality and response of the service we give.'* (Peter Fisher, Help Desk Manager) Peter was, overall, pleased with the way in which his operation worked. However he felt that a more systematic approach could be taken to identifying improvement opportunities. *'I need to develop a logical approach to identifying how we can invest into improving things like sophisticated diagnostic systems. We need to both reduce our operating costs and maintain, and even improve, our customer service.'*

What are the trade-offs that must be managed in this type of call centre?

Question 4 – Analysis

The figure shows four of the (probably many) trade-offs within Xexon7's call centre operations. The first is the trade-off involved in how staff are scheduled on an hour-by-hour basis. This in fact is the normal trade-off implied in any sort of queuing system. Scheduling more staff to be on duty than is normal guarantees a fast response time to client calls. This in turn increases the likelihood of giving good service and therefore securing future revenue. However it does mean that there is also an increased likelihood that staff will be underutilised and therefore operations costs will be higher. Reducing the number of staff on duty will reduce costs but may increase response time and therefore reduce service levels.

Some of the likely trade-offs at Xexon7's help desk call centre



The second trade-off mentioned concerns that between investing in a diagnostic system. This probably involves a high level of capital expenditure in a state-of-the-art system, but would speed up the diagnostic process and therefore improve client service.

Although not mentioned specifically, staff training may also figure as an important trade-off. Investing in training increases costs, but also reduces the chances of client dissatisfaction.

Product and service innovation

Question 1

One product for which customers value a very wide range of product types is that of domestic paint. Most people like to express their creativity in the choice of paints and other home decorating products that they use in their homes. Clearly, offering a wide range of paint must have serious cost implications for the companies that manufacture, distribute and sell the product. Visit a store that sells paint and get an idea of the range of products available on the market. How do you think paint manufacturers and retailers could innovate so as to increase variety but minimise costs?

Question 1 – Analysis

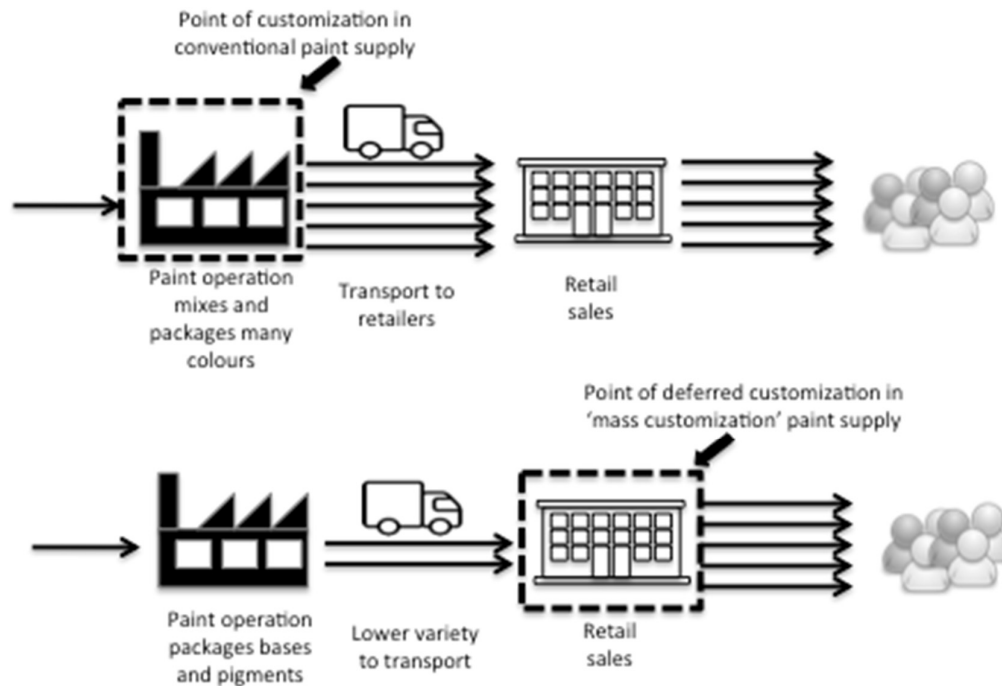
Some points to consider:

All brands will have a variety of colours but some brands may have a wider variety than others. Why do you think this is?

Some brands have a very wide selection of colours that are mixed on the premises. Usually this is done by adding different quantities of three or four colours to a 'base' of some kind.

This is called 'postponement' and is a common method of Mass customisation. In effect it is a supply chain if you see the diagram below.

Postponement of customization in paint supply



Question 2

'We have to get this new product and fast', said the Operations Director. 'Our competitors are close behind us and I believe their products will be almost as good as ours when they launch them'. She was talking about a new product that the company hoped would establish them as the leader in the market. The company had put together a special development team together with their own development laboratory. They had spent £10,000 on equipping the laboratory and the cost of the development engineers would be £20,000 per quarter. It was expected that the new product would be fully developed and ready for launch within six quarters. It would be so through a specialist agency that charged £10,000 per quarter and would need to be in place two quarters prior to the launch. If the company met their launch date it was expected that they could charge a premium price that would result in profits of approximately £50,000 per quarter. Any delay in the launch would result in a reduction in profits to £40,000 per quarter. If this development project were delayed by two quarters how far would the break-even point for the project be pushed back?

Question 2 – Analysis

First it is necessary to calculate the cumulative cost and profit flows assuming that the project goes entirely according to plan. This is shown in the table below.

Original estimate – assuming all goes according to plan (all figures in £'000)

	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10
Cumulative development costs	30	50	70	90	110	130				
Cumulative sales costs					10	20	30	40	50	60
Cumulative total costs	30	50	70	90	120	150	160	170	180	190
Cumulative profit							50	100	150	200
Cumulative cash	-30	-50	-70	-90	-120	-150	-110	-70	-30	10

	Q 11	Q 13
Cumulative development costs		
Cumulative sales costs	70	80
Cumulative total costs	200	210
Cumulative profit	250	300
Cumulative cash	50	90

As one can see from the table, the project will break even in quarter 10 that is four quarters after the launch of the product. However if the project is delayed by two quarters, four things will affect the cash flow of the project. First, development costs will be incurred for longer. Second, the sales agency costs will be incurred with no revenue to cover them. Third, revenue will be delayed by two quarters. Fourth profitability will be less per quarter than was estimated. All these things will affect the break-even point as shown in the table below.