



C4: Operations Management

Introduction and Module 1

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About this course manual

How this course manual is structured

The course overview

The course overview gives you a general introduction to the course. Information contained in the course overview will help you determine:

- If the course is suitable for you
- What you will already need to know
- What you can expect from the course
- How much time you will need to invest to complete the course.

The overview also provides guidance on:

- Study skills
- Where to get help
- Course assignments and assessments
- Activity icons
- Units.

We strongly recommend that you read the overview carefully before starting your study.

The course content

This course consists of **four** modules. Each module is broken down into units. Each unit comprises:

- An introduction to the unit content
- Unit objectives
- New terminology
- Core content of the unit with a variety of learning activities
- A unit summary
- An end-of-unit self-assessment
- Answers to the unit activities are at the end of each module.

Resources

For those interested in learning more on this subject, we provide you with a list of additional resources at the end of each module; these may be books, articles or web sites.

Your comments

After completing Operations Management we would appreciate it if you would take a few moments to give us your feedback on any aspect of this course. Your feedback might include comments on:

- Course content and structure
- Course reading materials and resources
- Course assignments
- Course assessments
- Course duration
- Course support (assigned tutors, technical help, etc.).

Your constructive feedback will help us to improve and enhance this course.

Course overview

Welcome to C4: Operations Management

This course examines the requirements for the operations function of an organisation and how that function can create customer value through effective processes in both product and service-based organisations. The emphasis is on strategic process inter-relationships and infrastructural requirements.

The role of operations management in production and service organisations is recognised and a variety of models are formulated to improve a firm's production processes and service delivery.

The supply chain management process is developed to improve the competitive position of the entire supply chain.

C4: Operations Management — is this course for you?

This course is intended for people who will manage the operations function of a firm, and/or people who will interact with the operations management function, and/or people who will have a general management role and need to know how the operations function should be designed, monitored, controlled and improved.

Students should have a basic understanding of quantitative analysis. The mathematics introduced in this course is not complex. However, some concepts require an understanding of regression analysis, normal distributions and spreadsheets.

Course outcomes

Upon completion of C4: Operations Management you will be able to:



Outcomes

- *Discuss* operations strategy and customer requirements and demonstrate how operations management can be used to improve the competitive position of a firm.
- *Summarise* demand management and forecasting.
- *Describe* capacity management and balance aggregate demand with capacity.
- *Illustrate* the basic requirements for process design (including continuous operations, repetitive operations, batch operations and job shop operations).
- *Discuss* process improvement and the concepts of lean thinking.
- *Explain* product design and quality management techniques, including six sigma quality and process capability.
- *Outline* the role of inventory management.
- *Describe* supply chain management and supply issues, including supply chain dynamics.
- *Identify* basic project management techniques.
- *Understand* the role of performance measurement in operations management.

Timeframe



How long?

This course will take approximately 120 hours of study time.

Study skills



Study skills

As an adult learner your approach to learning will be different to that from your school days: you will choose what you want to study, you will have professional and/or personal motivation for doing so and you will most likely be fitting your study activities around other professional or domestic responsibilities.

Essentially you will be taking control of your learning environment. As a consequence, you will need to consider performance issues related to time management, goal setting, stress management and so on. Perhaps you will also need to reacquaint yourself in areas such as essay planning, coping with exams and using the Web as a learning resource.

Your most significant considerations will be time and space, that is the time you dedicate to your learning and the environment in which you engage in that learning.

We recommend that you take time now — before starting your self-study — to familiarise yourself with these issues. There are a number of excellent resources on the Web. A few suggested links are:

- **<http://www.how-to-study.com/>**

The “How to study” website is dedicated to study skills resources. You will find links to study preparation (a list of nine essentials for a good study place), taking notes, strategies for reading text books, using reference sources, test anxiety.

- **<http://www.ucc.vt.edu/stdyhlp.html>**

This is the website of the Virginia Tech, Division of Student Affairs. Under “Cook Counseling Center” you will find links to time scheduling (including a “where does time go?” link), a study skill checklist, basic concentration techniques, control of the study environment, note taking, how to read essays for analysis, memory skills (“remembering”).

- **<http://www.howtostudy.org/resources.php>**

Another “How to study” website with useful links to time management, efficient reading, questioning/listening/observing skills, getting the most out of doing (“hands-on” learning), memory building, tips for staying motivated, developing a learning plan.

The above links are our suggestions to start you on your way. At the time of writing these Web links were active. If you want to look for more go to www.google.com and type “self-study basics”, “self-study tips”, “self-study skills” or similar.



Need help?



Help

Is there a course web site address?

What is the course instructor's name? Where can they be located (office location and hours, telephone/fax number, email address)?

Is there a teaching assistant for routine enquiries? Where can they be located (office location and hours, telephone/fax number, email address)?

Is there a librarian/research assistant available? Where can they be located (office location and hours, telephone/fax number, email address)?

Is there a learners' resource centre? Where is it located? What are the opening hours, telephone number, who is the resource centre manager, what is the manager's email address)?

Who do learners contact for technical issues (computer problems, website access and so on.)

Assignments



Assignments

There are two assignments in this course. The first is at the end of Module 2 and the second at the end of Module 3.

Assignment 1

Due date:

Value: 35 per cent

Modules covered: 1 and 2

Format: Three questions

Assignment 2

Due date:

Value: 35 per cent

Modules covered: 3

Format: Four questions

Assessments



Assessments

This course has a final exam.

Value: 30 per cent

Modules covered: All

Time allocated: 3 hours

Format: Answer any six questions from eight.


Getting around this course manual

Each unit has a small number of activities scattered throughout the unit. You should work through each activity without looking at the activity solution which follows. Use the activity feedback as reassurance that you have understood the activity.

Margin icons

While working through this course book you will notice the frequent use of margin icons. These icons serve to “signpost” a particular piece of text, a new task or change in activity; they have been included to help you to find your way around this course manual.

A complete icon set is shown below. We suggest you familiarise yourself with the icons and their meaning before starting your study.

			
Activity	Assessment	Assignment	Case study
			
Outcomes	Reading	Reflection	Study skills
			
Summary	Terminology	Time	Tip



Module 1

Introduction

This module introduces the subject of operations management by explaining strategy and competitive advantage and then examining how the operations function can make significant contributions to the organisation with an understanding of how the organisation competes.

Upon completion of this module you will be able to:



Outcomes

- *Explain* what is meant by strategy, strategic capability and competitive advantage.
- *Define* operations management and understand the importance of operations management.
- *Define* the customer and recognise the basic requirements of the customer.
- *Describe* the transformation process.
- *Distinguish* between products and services.

Unit 1

Strategy and competitiveness

Introduction

Strategy should be the starting point for any course on business or public administration. It is at the very core of any organisation and it does not matter whether that organisation is in the manufacturing sector, a service provider, a not-for-profit organisation or a government department. If it exists, then it must have a purpose. If it has a purpose, then it must have a strategy outlining how it intends to achieve that purpose.

Every decision made within an organisation should be consistent with the overall strategy for that organisation. Therefore, before we examine the operations function within an organisation we need to appreciate and understand the strategic role of operations.

This unit focuses on competitiveness and provides a broad framework for the study of the operations of business. It provides the fundamentals of general management and strategic management theories, tools and techniques. Moreover, the role of providing value in terms of customer satisfaction through understanding and meeting their requirements is key to defining the strategic direction of the business. The operations function is at the core of the business and the primary mechanism that creates the product or service. It is imperative that business strategy, operations strategy and value creation are viewed together since they cannot be separated.

Strategy and competitiveness are important for profit-based companies but are equally important for not-for-profit organisations and government departments since these entities have limited funding (revenue) and this has to be spent (expenses) in such a way as to maximise the benefits obtained.

This unit begins by investigating strategy and relating that to strategic capability. This leads to a discussion on the concept of core competence and the concept of qualifiers and order winners. We look at the levels within the organisation that strategic thinking can be carried out, the role of each level of the strategic plan and how these plans fit together. This will include explanations of the terminology used in strategy.

Strategy will then be explored in a variety of contexts that are differentiated by size, orientation (service and manufacturing) and

financial goals (profit and not for profit). We go on to study strategic decisions and introduce some ideas on competitive capability.

Upon completion of this unit you will be able to:



Outcomes

- *Explain* what is meant by strategy and strategic capability.
- *Explain* the concept of core competence.
- *Distinguish* between order winners and qualifiers.
- *Explain* how strategy exists at different levels in organisations.
- *Explain* the nature of competitive advantage.
- *Make* strategic decisions for an organisation.
- *Explain* operations strategy and explain the linkage with business strategy.
- *Explain* competitive capability.



Terminology

Core competence A bundle of skills that enable a firm to provide the greatest level of value to its customers in a way that is difficult for competitors to emulate and that provides for future growth. Core competences are embodied in the skills of the workers and in the organisation. They are developed through collective learning, communication and commitment to work across levels and functions in the organisation and with customers and suppliers.

Competitive advantage The advantage a company has over its rivals in attracting customers and defending against competitors. Sources of advantage may include factors such as technology, human skills and brand name.

Order winner A competitive characteristic that differentiates the products or services of one firm from another and causes a firm's customers to choose the firm's goods or services over those of its competitors. Order winners usually focus on one (rarely more than two) of the following strategic initiatives — price/cost, delivery speed, delivery reliability, product design, flexibility, after-market service and image.

Qualifier A competitive characteristic that a firm must exhibit to be a viable competitor in the market.

The set of characteristics must be present in order for the firm to “qualify” for the business.

Strategy

A set of broad statements that set the direction for the organisation to take. It specifies how to satisfy customers, how to grow the business, how to compete in its environment, how to manage the organisation, how to develop capabilities within the business and how to achieve financial objectives.

Terminology sourced from Gardiner (2010).

Strategy

The concepts of strategy originated in the military where generals would manoeuvre troops and weapons into position before battle commenced and during the battle hoping to be better-positioned than the enemy and secure a victory.

In the military sense, the starting point is to ensure you have the right resources ready for action at the right places with the overall objective of winning the battle and eventually the war.

Michael Porter, in the 1980s, developed the five forces model as a framework for analysing the structure of industry.

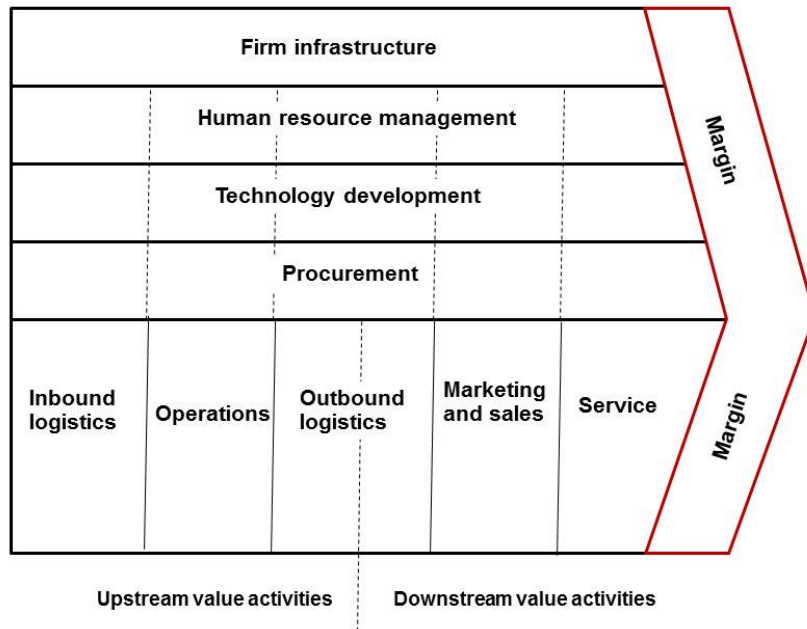
He based the model on five competitive forces that he claimed erode long-term industry average profitability. The five forces model explains the sustainability of profits against bargaining power and against direct and indirect competition.

The five forces model developed by Porter (1979) to shape business strategy are:

- Entry barriers to the market from other organisations. Barriers such as size, proprietary products and processes, and brand identity.
- Determinants of supplier power, such as differentiation, substitution and cost.
- Determinants of buyer power, such as volume, substitutes, incentives and buyer information.
- Availability of substitute products.
- Existing competitors.

Porter advocated that the formation of strategy is an analytical process based on a clearly defined position in the market. He supported this by analysis rather than prescription. His generic ideas have been widely accepted by management and academics as the foundation for competitive strategy. Academics, in particular, have used his models as the foundation for empirical testing.

Often used with the five forces model, Porter developed the value chain as a structure to capture the linkage between organisational activities that create value for the customer and profit for the firm.



The diagram above shows the value chain developed by Porter (1986, p. 24).

Strategy is a set of broad statements that set the direction for an organisation to take. It specifies how to satisfy customers, how to grow the business, how to compete in its environment, how to manage the organisation, how to develop capabilities within the business and how to achieve financial objectives.

The ultimate purpose of any organisation is to exist and to provide value to its stakeholders. If that organisation wants to provide added value, then it has to outperform its competitors. Some organisations, such as government departments, do not have “competitors” as such, but they are still expected to provide added value by spending resources to achieve better outcomes.

When considering your competitors, you need to know who is in front of you, and why, and who is behind you, and why. When you observe the competitor in front, you should know why they are in front. Are they better than you? Are they faster? Have they trained harder? Do they have better physical and mental attributes? What allows them to be in front of you and you to be behind them?

Also, when you look back and observe the competitor behind, you should know why they are behind. Are they not as good as you? Are they slower? Have they not trained as much? Do they not have the physical and mental attributes? What allows them to be behind you and you to be in front?

In business today, an organisation does not have to be in front, but it does need to know where it is relative to the competition and the reasons it is in that position. It needs to know what it has to do to hold its place, what it has to do to improve its position and which organisation is biting at its ankles and trying to relegate it into the pack.

Johnson, Scholes and Whittington (2008, p. 3) present a view of strategy that encapsulates these thoughts:

“Strategy is the direction and scope of an organisation over the long term which achieves advantage in a changing environment through its configuration of resources and competences with the aim of fulfilling stakeholder expectations.”

This looks at the long-term direction of the firm as it attempts to achieve some form of advantage. The scope of a firm’s activities and the concept of strategic fit which tries to match resources and activities are important. The available resources should be stretched and this may require some major resource changes. All decisions, not just operational ones, are affected by values and expectations.

Strategy decisions are usually made in situations of uncertainty. Technology will probably be the biggest driver of future change for business, but it is also the source of the most uncertainty since people do not know exactly what will happen and when. They can speculate, but they do not know the exact outcomes.

Most organisations are aware of the need to use a team approach in which the various functions work together to achieve joint outcomes. This requires functional integration.

Multinational firms and conglomerates find that strategic decisions are complex. With so much change in the world, it is extremely difficult for large firms, especially, to formulate a strategy that can add value and be successful in all areas at the same time.

Modern firms do not operate in isolation. They need access to good suppliers and they need a list of good customers. They may have to manage and change relationships and networks outside their organisation.

Strategic planning

Strategic planning is the process of determining the strategic plan which includes long-term goals, policies and plans for an organisation.

Henry Mintzberg, in the early 1990s, provided his definitions for strategy. These are known as Mintzberg's 5 Ps for strategy and help us to really understand what strategy is all about (Mintzberg & Quinn, 1992, pp. 12-19).



- **Plan.** Strategy is a plan, a consciously intended course of action, or a guideline to approach a business situation. This assumes that strategies are made in advance and that they are developed consciously and purposefully. Plans are intended strategy. In other words, an organisation develops a plan of what target (or goal) it intends to achieve and how it is to achieve it. For example, a bus company is formed with two buses and has a schedule covering peak-hour traffic on weekdays. It plans to expand to six buses after 12 months and have a full service from 6am to 9pm on all weekdays.
- **Ploy.** A strategy can also be a ploy, or a specific manoeuvre, intended to outwit a competitor.
- **Pattern.** Strategy is a pattern, or a consistency of behaviour, whether or not it is intended. Patterns are a realised strategy and can be divided into deliberate strategies and emergent strategies. Deliberate strategies are realised when previous intentions existed. Emergent strategies develop in the absence of intentions, or despite them. Following on from the bus company example (in Plan, above), the company may find that its service is very well patronised so bring forward the planned expansion and extend it to weekends as well.
- **Position.** Strategy is a position. Strategy becomes the mediating force, or “match”, between an organisation and the environment. In other words, the strategy assumes an intermediate position between where the organisation wants to go and where the environment expects the organisation to operate. As an example, a restaurant may source all its meat and vegetables from locally grown organic supplies. This may be more expensive, but satisfies a growing sector of customers.
- **Perspective.** Strategy is a perspective shared by members of an organisation, through their intentions and/or by their actions. It is an ingrained way of perceiving the world.

Defining strategy as a plan is not sufficient; we also need a definition that encompasses the resulting behaviour. The concepts of strategy as a plan and as a pattern can be quite independent of each other: plans may go unrealised, while patterns may appear without preconception. Using the bus company example (in Plan, above), the company may find that customers shy away from the service because of unreliable schedules. This may force the company to abandon its expansion plans.

Mintzberg (1994) suggested that strategic planning has impeded strategic thinking and he advocated that the term *strategic planning*

should be discontinued. Strategic planning failed because it is not the same as strategic thinking.

He claimed that strategic planning uses analysis by breaking a goal down into logical steps, designing how those steps should be implemented and articulating the anticipated outcome of each step.

In contrast, strategic thinking is all about synthesis involving intuition and creativity to form an integrated perspective, or a vision, of where the organisation should be heading. The outcome of strategic thinking is an integrated perspective, a not-too-precisely articulated vision of direction that must be free to appear at any time and at any place in the organisation.

Strategy-making should be a learning process. Formal systems can never internalise, comprehend, or synthesise hard information. The conclusion is that planning is not a learning process.

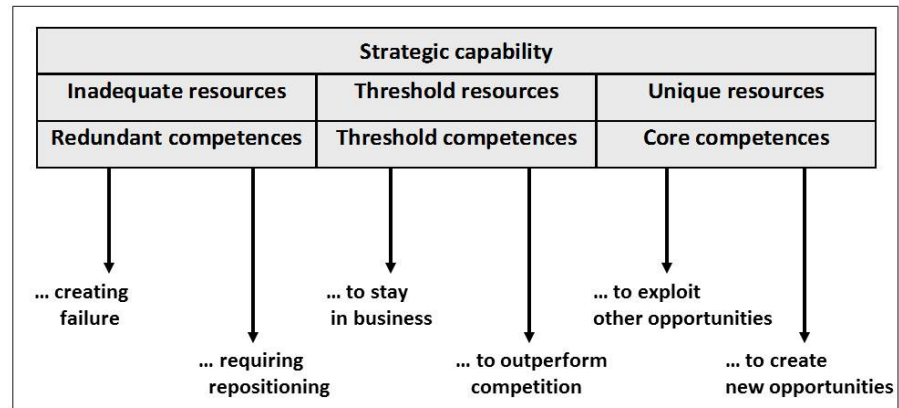
Strategic capability

When an organisation wants to be competitive it has to ensure that it has the resources and the capability to be successful. It has to fully understand the business and social environment in which it operates and to position itself relative to that environment. This is the strategic fit of the firm. It describes how well the firm fits into the environment. This positioning statement accepts the business conditions as an accepted fact and endeavours to provide adequate resources to effectively compete in that given market. While this approach is necessary for survival, it is also a very conservative approach since the current business conditions are known and it just requires the firm to match the need with adequate resources.

The firm should be prepared to change in order to keep up when the market changes. The firm has to recognise that the market has changed and it needs the ability to execute the required changes inside the firm, otherwise the firm backtracks and may not survive. For many years Kodak dominated the wet film industry but with digital cameras in wide use throughout the world the use of wet film has almost disappeared.

Sometimes, a firm may have a vision for the future that requires a radically different set of resources and processes than those currently being used in the market. This is particularly so for new and different companies such as Virgin Blue (airline), Dell Inc. (computers) and Zara (clothing). These firms have stretched their resources to change the rules of engagement.

The available resources are the full set of resources that are available to the firm. These may be split into inadequate, threshold or unique resources (Johnson et al., 2008, p. 118).



In the diagram above (Gardiner, 2010, p. 8 adapted from Johnson et al., 2008), the drivers of strategic capability include inadequate resources, threshold resources and unique resources.

Inadequate resources can be found in organisations that have not managed to maintain the pace. Their customers demand something different and they do not have the resources to deliver. It could be the resources that they are using are just getting old or do not have the technological capability their customers demand. It should be obvious that these resources need repositioning so that they can deliver value to customers, or the organisation fails.

Threshold resources are needed to just exist in a market. They support the minimum level customers will accept and allow the organisation to stay in business.

Unique resources critically underpin competitive advantage and sustain the ability to provide value. They are better than their competitors and are difficult to imitate. They allow the firm to exploit other opportunities and to create new opportunities.

Core competence

The concept of core competence was developed by Prahalad and Hamel (1990). They developed business strategy by starting inside the firm to see what characteristics made the firm different from the competition. They advocated that a firm would compete successfully if it had available resources that were not available to the competition.

Core competence is a bundle of skills that enable a firm to provide the greatest level of value to its customers in a way that is difficult for competitors to emulate and that provides for future growth.

Core competences are embodied in the skills of the workers and in the organisation. They are developed through collective learning, communication and commitment to work across levels and functions in the organisation, and with the customers and suppliers.

Core competence is developed through process improvement. For example, a core competence could be the capability of a firm to coordinate and harmonise diverse production skills and multiple technologies.

Prahalad and Hamel (1990) used the small size of Honda engines as an example. Honda exploited this core competence to develop a variety of quality products from lawnmowers and snowblowers to motorcycles, cars and trucks.

A core competence has three defining characteristics:

- It provides potential access to a wide variety of markets.
- It increases perceived customer benefits.
- It is hard for competitors to imitate.

When the customer receives a better product, better service, more innovation, a larger range from which to choose, more flexibility and/or more reliable delivery, then the firm enjoys success. Under these circumstances a customer places value on the fact that the customer's problems are being solved and the supplier is using resources to solve these problems.

It is often difficult to isolate specific things that make a difference but the firm is still successful. In this case it may be a bundle of skills and technologies that underpin the ability to meet critical success factors.

The differentiating competence, or bundle of competences, must be robust and should be difficult for competitors to imitate. Above all, core competence should provide opportunities for the firm, not limitations.

Competitive advantage

Competitive advantage is the advantage a company has over its rivals in attracting customers and defending against competitors. Sources of advantage may include factors such as technology, human skills and brand name.

When a firm is able to develop and deliver a product or service and satisfy customers at a lower cost, a faster rate and in a shorter time than its competitors, then it has a competitive advantage.

Qualifiers and order winners

Terry Hill (1993) proposed the concept of qualifiers and order winners.

A qualifier is a competitive characteristic that a firm must exhibit to be a viable competitor in the market. The set of characteristics must be present in order for the firm to “qualify” for the business. It



is used to screen a product or service as a candidate for purchase and must be present or the product or service is not even considered.

As an example, consider walking into a vehicle franchise wanting to buy a new car. You might have made a mental (or written) list of the criteria you consider essential. You might be looking for a car that can comfortably seat all the family, has a small fuel-efficient engine, runs on diesel fuel, is coloured blue, is a recognised brand, has good local service representation and costs less than a given amount of money. You can then look at the products that meet that list of requirements. All the products that meet that list qualify for your order since they all exhibit the qualifying dimensions.

However, an order winner is a competitive characteristic that differentiates the products or services of one firm from another and causes a firm's customers to choose the firm's goods or services over those of its competitors. Order winners usually focus on one (rarely more than two) of the following strategic initiatives — price/cost, delivery speed, delivery reliability, product design, flexibility, after-market service and image.

Examples of order winners and qualifiers are:

- price
- delivery reliability
- delivery speed
- quality
- volume flexibility
- design, including product range, lead times and design leadership
- distribution
- marketing and sales
- brand name and image
- colour range
- being an existing supplier
- technical liaison and support
- after-sales support.

Clearly, order winners and qualifiers are both market-specific and time-specific.

Strategic decisions

At the corporate level, an organisation must have a clear understanding of the environment in which it decides to participate both now and in the future. When this is in place, the functional strategies (marketing, finance, new product development, production and so on) can be developed. The overall agreement and understanding is essential. When each function understands the

order winners and qualifiers for each market and each range of products and each timeframe at a corporate level, then the organisation can develop functional-specific plans.

Marketing defines product functions and features, promotion policies, pricing algorithms, product positioning, distribution methods, advertising practices, brand awareness, channel structures, service levels, image requirements and sponsorship policies.

Finance and accounting define accounts receivable processes (debtors), accounts payable processes (creditors), cost of capital, levels of working capital, financial control methods, lines of credit, currency hedging methods and timings, and relationships with financial institutions.

New product and service development defines research direction, simultaneous engineering methods, technology platforms, time to market, criteria for selection and methods of production development and introduction.

Operations management defines the location, physical layout, products to produce, processes to use, process improvement initiatives, quality processes, work systems, purchasing systems, whether outsourcing and/or out-partnering is used, degree of vertical integration, scheduling systems and inventory philosophies.

Operations strategy

Operations strategy is the pattern of decisions and actions that shape the long-term vision, objectives and capabilities of the operation and its contribution to overall strategy. It is the way operations resources are developed over the long term to create sustainable competitive advantage for the business (Slack, Chambers, Johnston & Betts, 2006).

An organisation needs an appreciation of the part the operations function plays, how this fits into the corporate strategy, and the unique capabilities the operations function can provide to support and influence overall strategic goals. The operations function should give the company its competitive advantage, such as low cost, flexibility or high quality. The scope of decisions should be long term and investments should be made in capital resources and in the workforce.

Service organisations follow a similar process for their operations strategy development. The positioning of a service strategy depends largely on intangible service characteristics rather than tangible product characteristics.

A customer-driven perspective is required for operations strategy, whether it is for production or service organisations. This requires



the process design and process improvement activities to be oriented to satisfying the customer. This, in turn, means understanding exactly what the customer wants and developing processes that can deliver exactly that. Operating advantages are related to each of the organisation's processes and an organisation gains an advantage by outperforming competitors in one or more of these processes.

Competitive advantage is gained from core competencies, by an understanding of the business processes and by developing competitive capability.

Competitive capability

Competing on cost

An organisation may elect to compete purely on cost. It could achieve this by lowering prices to increase demand for products and services. However, this approach also reduces profit margins if the product or service cannot be produced at a lower cost.

Cost advantage can be gained by adopting lean thinking and cutting the cost of non-value-adding activities in the value chain. This may require extra investment in automation, a streamlining of procedures, additional training and development, and usually results in a narrower range of products or services.

A “no frills” airline competes on cost by reducing fares for the base service — travel with no checked bags, no free food and just music entertainment. A customer can get a very cheap fare if the travel portion is all they want. If, however, the customer wants more than that they can pay extra for checked bags, food and drinks and video on demand.

Competing on quality

An organisation may elect to compete purely on quality. Two aspects of quality have to be considered: high performance design, which includes superior features, close tolerances and greater durability, and consistent quality, which measures the frequency with which the product meets design specifications.

Customers want products that consistently conform to the specifications they contracted for, have come to expect, or saw advertised. An organisation can achieve product differentiation by developing expertise in product quality and process quality. The aim is to provide superior performance products that meet the specifications and are reliable.

Car companies such as Toyota and BMW compete on quality, since the concepts of quality feature at the top of their priority lists. Note that both these companies will argue that they compete on other issues and not solely on quality.

Competing on time

An organisation may elect to compete purely on time. This involves a short delivery time, which is the elapsed time between receiving a customer's order and filling it. Firms can shorten delivery lead times by storing inventory or having excess capacity. It also involves on-time delivery, which measures the frequency with which delivery-time promises are met. Organisations measure on-time delivery as the percentage of orders shipped when promised.

On-time delivery requires the product or service to be delivered at the first customer-requested delivery time. Firms may convince themselves that they are meeting delivery promises by shipping goods out the door on or before the delivery promise date and time. However, the customer does not see it this way. Customers want the product or service and they will measure on-time delivery as being the actual time the product is delivered to their location.

International courier companies use parcel-tracking technology to identify the exact location of all their deliveries and they promise delivery on time. Their technology reduces the chance of losing a parcel or misdirecting it.

Another aspect of competing on time is product development speed which measures how quickly a new product is introduced. This includes the elapsed time from idea generation through to final design and production. Getting a new product to market first gives a firm an edge and this is difficult to overtake in a rapidly changing business environment.

Competing on flexibility

An organisation may elect to compete purely on flexibility. Flexibility allows a firm to change volumes or products quickly to suit customer requirements. This is also referred to as customisation, which is the ability to accommodate the unique needs of each customer and changing product designs. Products are tailored to individual preferences. Customisation implies that the operating system must be flexible to handle specific customer needs and changes in designs. Volume flexibility is the ability to accelerate the rate of production quickly to handle large fluctuations in demand. The time between peaks may be years as in the construction industry, months as with a ski resort, or hours as with a postal sorting firm.

Dell computers is a good example of competing on flexibility. When a customer orders a Dell computer, the actual computer does not physically exist. Dell has the manufacturing capability to assemble exactly what the customer wants and ship it to them within a few days. The company has this flexibility by pricing the



configurations in favour of the components it can deliver. If a component (memory, hard drive, or screen) is in short supply Dell will offer that component at a higher price and customers will be encouraged to choose another component at a lower price and the alternative may be at a higher specification, which is even better.

Competing on service

Most competitive capabilities overlap and it is often difficult to precisely identify a particular capability and to quantify the effect it is having on performance. When competing on service, an organisation has a combination of all these competitive capabilities.

Each of these competitive capabilities has been presented separately. Clearly an organisation may select more than one competitive priority. For a particular organisation, it is a trade-off between the resources needed to develop the capability and the benefits to be obtained by possessing that capability. Additionally, a competitor may force an organisation to adopt another capability or even abandon an existing capability.

It is a very dynamic world.

Linking strategy with operations

Kaplan and Norton (2008) maintain it is imperative that the business strategy statement is translated into specific objectives that have to be achieved. Then the operational plans have to be developed to show the processes and resources that will be used to execute that business strategy. The organisation should learn from the experience and modify its business strategy.

The learning is based on performance review and performance measurement. The earlier strategy development has a level of expectation and the performance measurement records the achievement against the expectation. When a performance gap occurs, a learning process must take place to explain why and to adjust targets for future achievement. The learning and review process is at the strategic and the operational level.

The organisation has to adapt to a changing external environment. New technologies, new and changing competitors, new ideas, opportunities and threats all play significant parts in the process.

It is an on-going cycle of developing, translating, planning, learning and correcting.

Activity 1.1



Activity

Work through the following questions. You may need to go back and re-read the unit to help you.

1. What are the reasons for formulating and implementing an operations strategy?
2. How would you determine whether a company had an operations strategy or not? What specific questions would you ask and what information would you gather?
3. Find an example of an operation in your local community that has been successful in simultaneously improving quality, reducing throughput time, improving on-time deliveries and reducing costs. How has this operation been able to achieve these seemingly conflicting results?
4. Who defines the value of a product or service?

Unit summary



Summary

This unit began by identifying the origins of strategy in the military and discussed the work of Michael Porter and his five forces model. Henry Mintzberg developed the five Ps for strategy and this provided an interesting perspective on the topic.

Strategy was defined as a set of broad statements that sets the direction for the organisation to take. It specifies how to satisfy customers, how to grow the business, how to compete in its environment, how to manage the organisation, how to develop capabilities within the business and how to achieve financial objectives.

This led directly to the concepts of strategic capability, core competence and qualifiers, and order winners. An organisation needs to have or obtain the capability to deliver on its strategic intent and it achieves this ideal by developing core competences which allow the organisation to be better than competitors. When an organisation knows what characteristics make up the set of qualifiers and order winners, it can develop processes to deliver those characteristics.

The corporate strategy has to be disseminated to all functions and to all levels within the organisation. We were particularly interested in the operations function and how the operations function is required to develop processes to contribute to the achievement of the overall strategic goals.

An organisation can elect to compete on the basis of cost, quality, time, flexibility or on any combination of all of these competitive capabilities.

The final section in this unit discussed the learning that must take place when executing the strategic initiatives. The organisation should learn from the experience and modify the business strategy accordingly. It is an on-going cycle of developing, translating, planning, learning and correcting.

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Unit 2

The nature and role of operations management

Introduction

The operations function within an organisation is required to make a number of important decisions as part of its normal processes. These decisions are structural, such as where to locate and how big the facility should be, infrastructural decisions such as how should planning be performed and how should quality be determined, and integration decisions such as how all these actions and processes are tied together.

This unit defines operations management as the effective management of all the activities for creating, implementing, and improving value-adding processes that transform resource inputs, such as raw materials, technologies and labour, into output goods and services that meet the needs of customers.

For an organisation to do this, they need a detailed understanding of the customer and how they can meet the needs of the customer. To achieve this, the organisation will use a process that takes inputs and transforms them into outputs.

The modern view of operations does not distinguish between products and services. They are different in context but, as far as operations management is concerned, they should be treated the same. There will be occasions when a clear distinction is required but, in general, the theories and concepts within the whole operations management framework apply equally to production industries and services. One of the challenges in today's market is to take proven concepts from production and apply them to services.

This unit starts by distinguishing between structural, infrastructural and integration decisions within the operations function. This is aimed at setting out a framework for defining the function of operations management. Of prime concern to operations (indeed the whole organisation) is the customer and the needs of the customer so we include the definition of the customer and the definition of value. This is followed by a discussion on the transformation process. When you understand exactly what the transformation process entails, you have a good foundation for studying operations management.

This unit investigates the customer experience paradigm and concludes with a short history of operations management.

Upon completion of this unit you will be able to:



Outcomes

- *Define* operations management.
- *Define* the customer and recognise the basic requirements of the customer.
- *Distinguish* between structural, infrastructural and integration decisions in operations.
- *Describe* the transformation process.
- *Understand* the importance of operations management.
- *Distinguish* between products and services.
- *Explain* the role of operations management within the context of the whole organisation and the customer experience paradigm.
- *Define* the primary activities associated with operations management.
- *Trace* the history of operations.



Terminology

Customer	Customer is the next process or where the work goes next. This view can lead to internal and external customers, but the concept of satisfying the customer can only be fully implemented when considering the customer as the next process.
Operations management	Operations management is the effective management of all the activities for creating, implementing and improving value-adding processes that transform resource inputs, such as raw materials, technologies and labour, into output goods and services that meet the needs of customers.
Product	Product is any good or service produced for sale, exchange or internal use.
Service	Service is an activity or a series of activities to produce an intangible perishable experience usually involving the customer as a participant. Examples include repair, trade, commercial and infrastructure services such as transport, retail, communications, finance, real estate and personal services such as health, education, research, recreation, arts, restaurants, hotels, barber, beauty and laundry.

Transformation process Transformation process is the process of converting inputs into outputs. The inputs could be materials, customers, labour, energy, components, ideas, machines or requirements. The outputs could be finished products, satisfied customers, unsatisfied customers, components, subassemblies, developed ideas or developed concepts.

Terminology sourced from Gardiner (2010).

Operations management

Operations management is defined as the effective management of all the activities for creating, implementing and improving value-adding processes that transform resource inputs, such as raw materials, technologies and labour, into output goods and services that meet the needs of customers.

Operations management is the management of the direct resources required to produce the goods and services provided by an organisation. It focuses on the function of providing the product or service.

The aim is to produce specified products and services on schedule at minimal cost. Most organisations have additional performance measurements including volume of output, costs, utilisation, quality, product reliability, delivery in full, on-time and in specification (DIFOTIS), return on investment and flexibility of product and volume change.

The customer

The objectives of operations management should be viewed from the customer's point of view. When the customer is defined as the next process, or where the work goes next, it becomes obvious that the customer can be internal to the firm as well as external. Regardless of the type of business, all customers generally have these six basic requirements (Knod & Schonberger, 2001, p. 17):

- higher level of quality
- higher degree of flexibility
- higher level of service
- lower cost
- less time or quicker response
- less variability.

The customer should determine the quality of the required output. When the customer demands a higher level of quality, the supplier



has to understand exactly what the customer wants, when they want it, how they want it and why they want it, and then deliver exactly that.

Over time customers change their behaviours, preferences, styles, ideas, desires, wants, needs and relationships. Therefore, the supplier needs to understand these changes and have the capability to react to whatever volume or product is required.

Customers demand higher levels of service. However, this is often very hard to determine, especially with the merger of products with service. Nevertheless, suppliers are expected to truly understand the customer with objective and subjective measures.

Customers always want lower costs. However, it is not just the price that needs to be lowered; it is the total cost to the customer. Some organisations, especially in information and communications technology, refer to this as the cost of ownership.

Customers want their products and services delivered in less time. This requires shorter cycle times, shorter delivery times and faster service response. The real measure is consistency of performance and this requires less variability. In other words, the output from one occasion is expected to be the same as the output from the next.

A clear distinction needs to be made between customer and consumer. The consumer is the person at the end of the supply chain that benefits from the product or service. All the way through the supply chain we have supplier-customer relationships.

Most people will think of the customer as the person who buys the product or service. The payment for products and services may occur at any point in the supply chain or at the end. Essentially, the payment recognises a change of ownership for a product or the completion of the service. The final person who pays for the product or service is called the end customer or final customer or consumer.

In a service environment, such as a hospital, all the employees work together. No money is changing hands. The admission staff, surgical teams, nursing staff, kitchen staff, orderlies, pharmacists, radiologists, maintenance staff and administration staff perform various aspects of the required job. A patient may be moved from admissions to a ward, from the ward to the operating theatre for an operation, from the operating theatre to recovery and from recovery back to the ward before being allowed to go home. There is a customer and a supplier relationship at each step. At each step, each health professional expects higher levels of quality, higher degrees of flexibility, higher levels of service, lower costs, shorter lead times and less variability.

Structural decisions in operations

In the previous unit we established a strategy for the organisation and extended that by developing a strategy for the operations function. When the operations strategy has been developed and fully understood by the management team, then the operations manager can make the required structural decisions. The categories of structural decisions include capacity, facilities, process technology, vertical integration and supplier relations.

Be aware that the operations manager can make structural decisions without the help of an operations strategy but this is likely to lead to an undesirable outcome.

Capacity

Capacity decisions determine how much can be produced and in what time. An organisation should pre-determine how many products or how much service it has to produce and then make sure it has sufficient capacity to deliver those quantities. A company can obtain capacity before it is needed, at the same time as it is needed, or after it is needed. There is no correct time to increase capacity (or decrease capacity) as this depends on a number of factors such as cost, the competitive advantage that the extra capacity will provide to the organisation and the capacity available to competitors in the same industry.

An organisation is exposed to significant risk when basing capacity decisions on predicted growth, especially if the expected growth does not materialise. On the other hand, it can provide significant market opportunities and production capability allowing the organisation to respond quickly to market demands. Capacity that is increased after the need has been established allows the organisation to fully utilise its current capacity and the capacity decisions carry less risk.

Facilities

When an organisation starts, and when it changes, it needs a facility in which to operate. Decisions on where that will be located and what will be produced relate to the number, size, location and specific nature of facilities. Location, for example, is important for service organisations that do not produce a tangible product. Banks, motels and fast-food restaurants cannot easily operate unless they are near customers. Manufacturers whose products are very bulky or heavy must consider location and transport logistics.

Facility decisions are key determinants of a firm's ability to compete on the basis of cost and delivery.



Process technology

Process technology decisions determine how products and services will be produced in order to meet demand. The operations manager needs to consider the appropriate way to produce the product or service, given the cost, quality, delivery patterns, degree of flexibility and response time necessary to accomplish strategic objectives. Variables such as volume, lot sizes, degree of customer interaction and the amount of customisation/standardisation required are influenced by the choice of process technology.

Process technology decisions seek to bring about improvements in the competitive capabilities of cost, quality and flexibility and will have a significant influence on costs.

Vertical integration and supplier relations

Vertical integration decisions deal with the portion of the product or service an organisation will produce itself compared with the portion it will purchase and the extent to which it will market, distribute and sell the product.

Backward integration is the vertical integration of suppliers and has significant impact on the supply base, cost and quality. Cost is influenced by vertical integration decisions because of the influence that suppliers' prices have on material costs.

Organisations seek to increase their control of raw material and purchased item quality through backward integration.

Forward integration is the extent that the organisation links with customers.

Infrastructural decisions in operations

Infrastructural decisions can be made simultaneously with the structural decisions, but in a practical sense would more than likely follow the structural ones. In general the infrastructural decisions cover the supporting mechanisms and philosophies relating to operations.

The categories of infrastructural decisions include human resources, quality, production planning and inventory control, new product and service development, performance measurement and reward, and organisation systems.

Human resources

Human resources should be directed towards maintaining customers and enhancing customer experiences and include the selection, training, education, retention and rewarding of employees. The choices made have a significant effect on cost, quality and the customer experience. The skill level and experience of the workforce has an effect on quality, time and flexibility.

Salaries and wages paid to employees have a direct effect on cost, especially for service organisations.

Quality

Quality systems have a significant effect on cost and delivery lead time. Processes designed and improved with quality as the driver help to reduce the cost of production and the time it takes reduce. The money spent to improve the process capability is usually more than offset by the reduction in scrap, rework and other on-going costs.

Production planning and inventory control

Production planning decisions relate to what will be produced, when and how it will be produced as well as the quantity. These all affect cost, quality, delivery and flexibility.

New product and service development

New product and service development decisions affect the cost of bringing a new product or service to market. Design decisions affect ongoing production costs and have a long-term effect on flexibility. New product and service development decisions usually have a positive effect on quality, since quality improvement is one of the main drivers for introducing new products and services.

Performance measurement and reward

Performance measurement and reward decisions have a significant effect on cost since most reward systems are monetary.

Organisation systems

The structure of the organisation will have an effect on flexibility and time. An organisation may find decisions are not being made quickly enough to be competitive and reporting line processes may inhibit flexibility. The organisational culture may affect line and staff relationships, thus adding to cost, quality and flexibility priorities.

Integration decisions in operations

All structural and infrastructural decisions need to be integrated. The categories of integration decisions include communication, alignment, and linkage systems.

Communication

Operations, human resources, and marketing have to communicate among themselves so they are all aware of changes in schedules, supplier deliveries, customer requirements, customer preferences and agreements that have been made. One function, for example, may agree to a process concession and, without any communication



advising the change, another function may wait for the original arrangement to eventuate. A customer may accept a slightly different product specification and receives a pricing concession. This needs to be communicated to all affected parties.

Alignment

Alignment refers to the degree of integration relative to the depth of the customer experience. The depth of the customer experience may increase as a result of marketing and/or the actions of staff at the point of delivery. This, in turn, generates the need for significant effort to be given to collaboration and co-ordination across business functions that are involved in designing and delivering experiences.

Linkage

Service delivery systems that enhance the customer experience require strong linkages between the classical traditional operations decisions, such as capacity planning, scheduling, quality, technology choice and the allocation of particular staff members, and the point of delivery of the customer experience. At the point of delivery of the customer experience, spontaneous decisions are made that cannot reasonably be reconciled against a traditional planning system. The timeframe is too short. It is all happening now.

The transformation process

The transformation process lies at the very foundation of operations management. The entire operations management function strives to find value-adding processes that take inputs and transform them into outputs. The transformation process aims to maximise the value added and reduce the cost added to the product or service delivered to the customer.

The transformation process adds value by making the product more readily available, by providing a faster service, by providing customers with additional relevant information, and/or by customising the product to the customer's specific needs.

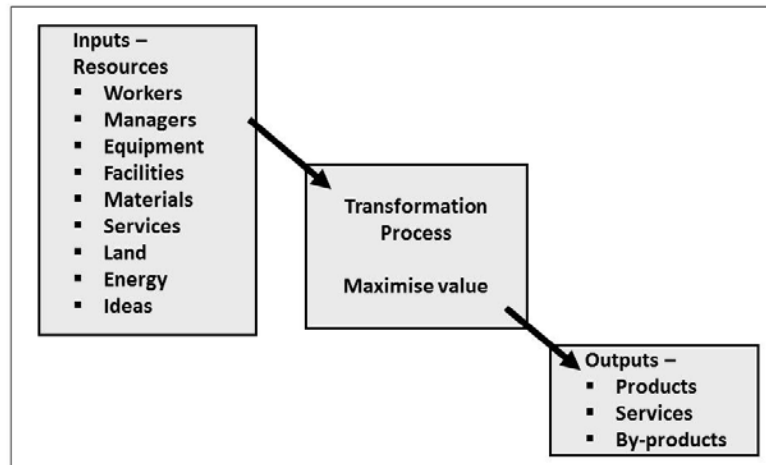
The process can reduce the cost to the customer by eliminating unnecessary steps.

The transformation can either be production (goods producing) or service (service providing). Examples of transformations include: manufacturing, distributing, transporting, retailing, farming, mining, refining, providing healthcare, educating, entertaining, providing tourist facilities, cooking, providing accommodation, repairing and assembling.

For example, a furniture manufacturer would have raw material inputs including wood, fabric, fasteners, glue, packaging materials,

instructions and care leaflets. In order to make the furniture, the manufacturer uses labour inputs, machine inputs, energy inputs, management inputs and the transformation will take place in a factory building located on some land. The quality, availability and cost of these inputs will have a defining influence on the actual output of the transformation process.

In a service industry the major inputs would usually be people who are interfacing with customers.



The diagram above (Gardiner 2010, p. 25) illustrates the transformation process with inputs such as workers, managers, equipment, facilities, materials, services, land and energy and with the outputs being products and services and the overall objective of maximising customer value.

Activity 1.2



Activity

The following table of production organisations has been completed for “Electrical appliances”. Complete the table for a bakery, a clothing manufacturer, a packaging company and a dairy products company.

The inputs use nouns; the transformations use verbs; and the outputs use nouns. This simple definition of language helps to visualise the process.

Organisation	Inputs	Transformation process	Outputs
Electrical appliances	Raw materials Components Printed circuit boards Insertion machines People skills	Fabricating Assembling Inserting components in PCB Packaging Distributing	Finished goods such as stereos, TVs, DVDs, household appliances delivered to warehouses and retail stores
Bakery			
Clothing			
Packaging			
Dairy products			

The following table of service organisations has been completed for 'Air transport'. Complete the table for a computer centre, a restaurant, a hospital and a bank.

Organisation	Inputs	Transformation process	Outputs
Air transport	Airport infrastructure Reservation system Aircraft Flight crews Cabin crews Ground staff Fuel Food	Reserving passengers Scheduling flights Scheduling crews Checking-in passengers Maintaining aircraft and equipment Cleaning and provisioning aircraft Preparing meals	Passengers with reservations for travel Passengers safely on board aircraft Passengers fed and watered during flight Passengers and luggage safely delivered to destination Freight carried and delivered
Computing centre			
Restaurant			
Hospital			
Banking and finance			

Activity feedback can be found at the end of this module.



Products and services

In the past it was quite easy to differentiate between a manufacturing company and a service organisation. Manufacturing companies start with raw materials and after a number of processes produce a product that could be sold to a customer. Service industries provide a service. That distinction is very simplistic.

Today, however, manufacturing and services are intertwined to such an extent that it is difficult to find a manufacturing company that does not provide some elements of service and, likewise, it is difficult to find a service firm that does not make something.

So we can start the discussion on products and services by defining a product as any good or service produced for sale, exchange or internal use.

Products are things and can be touched, seen, kicked or destroyed. Products can be made and the quality of the production process can be measured quantitatively.

The final customer (or consumer) of a product becomes involved after the product has been made. A telephone, for example, is manufactured in a factory, sent to a distributor, then to a retailer and then sold to a final customer before the customer starts to use or consume it. The customer has very little input while the product is being made. They may interact with the retail salesperson but their specific voice will not be heard during the production process.

Products can be stored for subsequent use. This allows the manufacturer to make in advance of requirements and to supply a quantity that is different from the quantity demanded. This has implications in forecasting demand, capacity management and production scheduling. The production activities can be separated from the customer demand activities.

A service is an activity or a series of activities to produce an intangible perishable experience, usually involving the final customer as a participant. Service examples include commercial services such as retail, restaurants, communications, finance, and real estate and infrastructure services such as transport, and personal services such as health, education, research, recreation, arts, hotels, barber shops, beauty and laundry.

Services are intangible. Often, especially with pure services, the output is an idea as in architectural design, advertising, product design and promotion. Some services such as insurance, banking and investments will refer to their outputs as products but they cannot be physically touched. When you insure your house and contents against fire and theft what have you got to show for it? You might have a piece of paper and hopefully you will have peace

of mind. The product is definitely intangible. The intangible nature of services makes it difficult to assess the quality of the output. You might attend a concert and be thoroughly entertained and enjoy the experience. However, another person might attend the same concert and not enjoy the experience. Was that a good service or not? Who knows? Quality is determined after the fact.

Service customers are usually involved while the service is being produced and delivered. In fact, the customer is in most cases an active participant. Patients enter a medical centre and request attention. They are physically present and the medical examination is performed on them personally. Any required medicines are prescribed just for them. This customer presence has a significant bearing on the quality of output as the customer can make comments during service delivery. The service provider can change the delivery process and satisfy the customer.

Services usually cannot be stored and this means that they require a close match between the rates of supply and demand. Services need to cope with peaks in the demands for transport, accommodation, medical services, ticketing, banking and call centres. Everyone, it seems, wants to travel during peak periods; everyone, it seems, wants to eat at the same time; everyone, it seems, is sick and requires immediate attention at the same time. This puts added pressure on the service provider to introduce innovative ideas to smooth out the peaks and lows. Especially with fixed capacity services, such as airlines and hotels, the service is perishable. An empty airline seat on a plane that has just taken off cannot generate any income. The opportunity is lost. Likewise an empty hotel room for a night generates no income. Last week's empty hotel rooms will never generate any income. In fact they could even contribute to a loss if the overheads are not covered.

Activity 1.3



Activity

We have discussed the differences between products and services. Think about your experiences with products and services and prepare a list of similarities between products and services.

Products and services are similar in the following ways:

Activity feedback can be found at the end of this module.

Customer experience paradigm

More and more customers want an emotional involvement with the service delivery. Organisations that recognise this emotional involvement and who present their service to allow this, find their customers keep coming back and they spend more and they bring their friends along as well. Experience-centric describes a service for which the customer experience is at the core of the service offering. The customer has emotional connections that are engendered through engaging and compelling activities and delivered in memorable and meaningful ways (Voss, Roth & Chase, 2008).

The perceived value of the service now includes experience factors which may start at the initial point of interaction. As an example, consider going on-line and making an airline reservation during a super promotion. On this occasion the airline is offering a limited number of good seats for \$1. Potential customers queue in anticipation and have Web pages pre-activated so that as soon as the availability is announced the customers are ready to pounce. If they are successful, they brag about it to their friends. If they are

unsuccessful, they simply try again and tell their friends how close they were to scoring a cheap fare.

Each experience is aimed at the next encounter and success is measured in terms of customer purchasing patterns, loyalty, and engagement behaviours that are generated by the unique nature of the experience, the knowledge, the novel aspects, the memories and the sheer entertainment that provokes customer emotions, sensations, imagination, feelings and perceptions.

Social networking plays a significant role in creating loyal communities and fans. The customers' enthusiasm promotes the brand by word-of-mouth.

Short history of operations

Industrial revolution

Before the industrial revolution all production processes were conducted in the home. Food preparation and processing were domestic activities. Transport vehicles such as trailers, carriages and other horse-drawn vehicles were largely fabricated in a home environment. The industrial revolution towards the end of the 18th century signalled the birth of operations management with the change from cottage industries to factory production.

Scientific management

Frederick W. Taylor developed his four principles of management: research, standardisation, control and co-operation. His systems included cost accounting, unit time study, inventory control, production control, planning, output scheduling, functional operation, standardised procedures, a mnemonic system of classification and means for maintaining quality production. He discovered that basic scientific laws govern work and that every person is different and these differences can be exploited. He introduced wage incentive plans and separate responsibilities for workers and managers.

Human relations movement

Elton Mayo conducted a number of experiments at the Hawthorne plant of Western Electric in the 1920s. He studied the effects of group incentives on productivity, social psychology and worker performance.

Operations research

Operations research and management science uses mathematical models to solve operations problems such as personnel and production scheduling, vehicle routing and logistics, facility location, capacity planning and facility design, queuing, inventory planning and statistical quality control.



Just-in-time and lean production systems

Just-in-time and lean production systems were developed inside the Toyota Motor Company just after the Second World War and focused on total quality management, lean production, continuous improvement of products and processes, the elimination of all waste, flexible manufacturing systems and computer-aided design/computer-aided manufacturing.

Recent developments

The use of electronic systems such as the Internet, the World Wide Web, electronic commerce, business-to-business linkages and business-to-customer linkages have generated significant change in operations management. Significant development has occurred with the management of supply chains especially global supply chains. Additionally, the importance of service operations management is being recognised.

Activity 1.4



Activity

Work through the following questions. You may need to go back and re-read the unit to help you.

1. Which is more important – infrastructural or structural or integration decisions? Explain your answer.
2. What does operations management mean?
3. How is the transformation process related to value?
4. Who defines the value of a product or service?
5. How would you define the customer perceived value?

Unit summary



Summary

In this unit you learned how to distinguish between structural, infrastructural and integration decisions in operations. This was followed by a definition of operations management. You recognised the basic requirements of the customer and how each process should recognise these requirements.

Fundamental to operations management is the transformation process and this was discussed in relation to a number of organisations in production and services.

We distinguished between products and services in case we have to specifically make the distinction, but bear in mind, that for the most part, operations managers treat them the same.

The role of operations management within the context of the whole organisation was explained and we introduced the concept of the customer experience paradigm.

The unit concluded with a short history of operations.



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Readings for further study



Reading

- Beckman, S. L., & Rosenfield, D. B. (2008). *Operations strategy: Competing in the 21st century*. Boston, MA: McGraw-Hill/Irwin.
- Fitzsimmons, J. A. & Fitzsimmons, M. J. (2008). *Service management: Operations, strategy, and information technology* (6th ed.). New York, NY: McGraw-Hill Irwin.
- Gardiner, D. (2010). *Operations management for business excellence* (2nd ed.) (pp 1–38). Auckland, New Zealand: Pearson Education.
- Heizer, J. & Render, B. (2010). *Operations management* (10th ed.). Upper Saddle River, NJ: Prentice Hall.
- Voss, C., Roth, A. V., & Chase, R. B. (2008). Experience, service operations strategy, and services as destinations: Foundations and exploratory investigation. *Production and Operations Management*, 17 (3), 247–266.

Activity feedback

Activity 1.1 and 1.4

All answers are in the learning material.

Activity 1.2

Compare your answer to this completed table of production organisations.

Organisation	Inputs	Transformation process	Outputs
Electrical appliances	Raw materials Components Printed circuit boards Insertion machines People skills	Fabricating Assembling Inserting components in PCB Packaging Distributing	Finished goods such as stereos, TVs, DVDs, household appliances delivered to warehouses and retail stores
Bakery	Flour Sugar Flavourings Packaging Energy People skills	Mixing ingredients Baking Packaging Distributing	Bakery items such as buns, bread, muffins, biscuits delivered to warehouses and retail stores
Clothing	Fabrics Threads Findings (buttons clips and clasps) Energy People skills	Laying fabric Cutting fabric Sewing garments Packaging Warehousing Distributing	Range of garments such as pants, shirts, dresses, coats delivered to retail outlets
Packaging	Paper Plastic Glue Inks Energy People skills	Preparing artwork Printing Guillotining Slitting Packing Distributing	Packaging items such as cases, cartons, boxes, packets to meet customer specifications warehoused and delivered to production facilities



Dairy products	Milk Flavourings Containers Packaging	Pasteurising Separating Mixing Packing Distributing	Dairy products such as milk, cream, yoghurt, flavoured drinks delivered to supermarkets
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Compare your answer to the completed table of service organisations.

Organisation	Inputs	Transformation process	Outputs
Air transport	Airport infrastructure Reservation system Aircraft Flight crews Cabin crews Ground staff Fuel Food	Reserving passengers Scheduling flights Scheduling crews Checking-in passengers Maintaining aircraft and equipment Cleaning and provisioning aircraft Preparing meals	Passengers with reservations for travel Passengers safely on board aircraft Passengers fed and watered during flight Passengers and luggage safely delivered to destination Freight carried and delivered
Computing centre	Computing equipment Stationery Energy People	Updating records Maintaining security Printing Enveloping Distributing	Information processed quickly and accurately for internal and/or external customers
Restaurant	Kitchen and table equipment Food Energy People Wine and drinks	Setting tables Taking orders Preparing and cooking food Waiting at tables Washing cutlery and dishes General cleaning	Guests enjoying ambience Guests fed and watered An enjoyable experience
Hospital	Medical supplies Drugs Doctors Nurses Other staff	Operating Nursing Dispensing drugs and medicines Preparing meals	Well patients Long term patients New babies Trained staff Dead people

	Food	Keeping records	(unfortunately)
Banking and finance	Bank buildings Computers Tellers Automatic teller machines (ATM)	Processing deposits and cheques Investing money Providing loans and mortgages	Money safe and available when required Safe and profitable investments Money well spent

Activity 1.3

Products and service are similar in many ways.

- Use customer satisfaction as a key measure of effectiveness.
- Have common measures of satisfaction (for example, speed and quality).
- Require demand forecasting.
- Require product design and process design.
- Depend on location and arrangement of resources.
- Involve purchase of materials, supplies and services.
- Can be provided in high or low volumes.
- Can be standard or customised.
- Are subject to automation.
- Need an operations strategy consistent with business strategy.

As seen from this list, products and services are very similar. All organisations can benefit from improving their processes. It does not really matter whether an organisation sees itself as a manufacturer or a service provider.