

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

**Cambridge International Diploma in Management  
Professional Level**

Scheme of Work

4250  
Managing Operations  
Optional Module



UNIVERSITY *of* CAMBRIDGE  
International Examinations

## MODULE NUMBER (OPTIONAL) 4250: MANAGING OPERATIONS

### BRIEF INTRODUCTION AND MODULE OUTLINE

This optional module deals with the importance of having efficient operations, whether this is in a manufacturing or service environment. It asks candidates to consider the different approaches to operational management and the increasing emphasis on customers and their requirements. Being aware of the different approaches will enable candidates to appraise their own organisations and identify areas for improvement.

The module encourages candidates to explore the links between organisational objectives and operations, the customer-supplier chain, the concept of internal and external customers and how operations need to be geared to meet their needs. It also looks at how to set performance standards and manage the operations to ensure these are being maintained. This provides an opportunity to explore a range of quality monitoring approaches and how to plan and schedule work to meet demands. The importance of effective resource planning and management is a key feature of this module.

Assessment objectives:

1. Identify operational strategy and its position within the organisation
2. Identify supply chains in the organisation
3. Plan, schedule and manage operational capacity
4. Set and control operational standards
5. Manage resource requirements and use

### RECOMMENDED PRIOR KNOWLEDGE

No prior knowledge is required for this module, but the Unit Introductions do make suggestions about preparatory work and background reading which would help to promote understanding.

### SUGGESTED TEACHING ORDER / SUMMARY SCHEME OF WORK

Apart from the need to ensure that any requirements for prior knowledge are addressed, the module sits comfortably at any point in the Programme. Indeed, this is an optional module and may not be taken by all candidates, but for those that do select it, there are strong links between this and Managing for Quality and it may be advisable to position these two modules together.

The Managing Operations module is made up of 5 assessment objectives which follow a logical order from identifying processes to planning and scheduling work and resources. The teaching should follow this logical progression, although there are areas of overlap and tutors may choose to exercise some flexibility here.

The column headed **Explanation of competence criteria** is designed to give an indication of the main content to be covered and should help with this planning detail.

### UNITS / ASSESSMENT OBJECTIVES: SUGGESTED ORDER

1	Identify operational strategy and its position within the organisation  This unit requires candidates to identify the link between strategic objectives and operational objectives at department level. It looks at different types of operation and how to set objectives in line with strategy.
2	Identify supply chains in the organisation  This helps the candidate to differentiate between internal and external customers and suppliers. It also explores the flow of information between different parts of the process. Supply chain models are introduced and used to show how value can be added at different parts of the process.
3	Plan, schedule and manage operational capacity

	This unit looks at how managers can plan and schedule operations to meet objectives. The concept of push and pull systems is introduced and a range of planning tools are made available to the candidates. Capacity planning and scheduling tools, such as Gantt charts are a feature of this unit. The candidates are also required to use various techniques to forecast resource requirements.
4	<p>Set and control operational standards</p> <p>Having established the customer requirements, this unit looks at how standards of performance can be defined and monitored. A range of analytical tools are introduced and candidates are encouraged to explore these with different types of operation. Monitoring systems are introduced and suggestions made for recording findings. The importance of communicating the quality procedures is explored, bringing in the role of the team or individual in maintaining standards.</p>
5	<p>Manage resource requirements and use</p> <p>This unit requires candidates to consider the issues around resource management to support operations. It looks at the human resource, the material resource and the capital resource. Issues such as the skills mix, task allocation and staff planning are explored, as are inventory control, purchasing, facilities layout, maintenance and wastage. Other aspects, such as health and safety and the environment are also included, as these directly affect operations.</p>

### LIST OF RESOURCES

There is a wealth of accessible and readable material about managing operations and resource management. Most general management books include sections on managing operations and there are websites available on the subject too. Some suggestions are included in the Cambridge International Diploma (CID) in Management recommended reading list and the Biz Ed website may be a useful source of information (<http://www.bized.ac.uk>).

Candidates should be encouraged to read around the subject and in particular to look at Operations Management by Slack, N., Chambers, S., Harland, C., Harrison, A. and Johnston, R (2003). This established work is published by Financial Times Prentice Hall and supports this module very well and includes small case studies for each section.

#### Other notable works include:

Waller, D. (2003), Operations Management: A Supply Chain Approach, Thomson Business Press, Naylor, J. (1996), Introduction to Operations Management, FT – Prentice Hall, Bicheno, J. (2000) The Lean Toolbox, Picsie Press, Pande, P., Holpp, L. (2001) What is Six Sigma?, McGraw-Hill.

**Unit 1: Identify operational strategy and its position within the organisation**

**Recommended prior knowledge:** No prior knowledge is required for this unit although awareness of simple analysis tools such as PESTLE and SWOT would be useful. An awareness of the issues of change management, such as that covered in the core module, Managing Change would also be of assistance.

Candidates should be encouraged to read around the subject, particularly in the area of objectives. Operations Management by Slack et al is an excellent resource.

In addition, the internet contains a range of sites that look at objective setting and a number of case studies are available. It is useful to look at the Times 100 website, the Biz Ed website or the Chartered Management Institute (CMI). Using the search facility 'case studies' and 'operational management' also brings up useful information.

**Outline:** Identify operational strategy and its position within the organisation requires candidates to analyse the link between strategic objectives and operational objectives and the types of operations that best meet customer requirements.

COMPETENCE CRITERIA		EXPLANATION OF COMPETENCE CRITERIA	SUGGESTED TEACHING ACTIVITIES
1.1	Identify the vertical alignment of strategies within the organisation	<ul style="list-style-type: none"> <li>organisational strategy or business objectives and how departmental strategies directly contribute to these</li> </ul>	<p>Ask candidates to write down the mission, key strategy or business objectives of their own organisations. They should then identify the objectives or strategy for each department or business unit. Using a code or a series of + and – signs, get them to assess how well each strategy fits with the one above and below it.</p> <p>Alternatively, you could give the candidates some examples to work on, including those that show good vertical alignment and those that do not.</p> <p>Use discussion to bring out the importance of alignment and the possible effects of mismatch.</p>

1.2	Identify appropriate performance objectives of operational strategy	<ul style="list-style-type: none"> <li>identifying the key purposes or performance objectives and the meaning of these to the operation and the end-user</li> </ul>	<p>Introduce the concept of Quality, Speed, Dependability, Flexibility and Cost as the basis of objectives. Ask the candidates to identify what each these means for operations (for example, quality means error-free processes) and the benefits for the end-user or customer (for example, quality means products/services will meet the specification).</p> <p>Discuss the importance of prioritising objectives, in terms of customer needs, competitor activities and the position of the product/service in its life cycle. Generate discussion on the relative importance their organisations place on Quality, Speed, Dependability, Flexibility and Cost and use some examples of well known organisations, such as MacDonaldis, Body Shop, a car manufacturer and a major airline, for example.</p>
1.3	Identify the type of operation most effective within the organisation to meet customer requirements	<ul style="list-style-type: none"> <li>different types of operation or systems and how these may differ for manufacturing and service organisations</li> </ul>	<p>Introduce the five main types of operation for manufacturing: Project, Job shop, Batch flow, Line flow and Continuous flow. Discuss when each of these might be used, bringing out the effects of quantity required and the range of different products being produced.</p> <p>Then compare this with a service operation, bringing out the flow of people rather than materials and how the degree of customer involvement impacts on the operation (for example, a restaurant, a bank, a government department or charity), whether the organisation is offering a service package for a range of customers or a specific service for a specific customer. It may be useful to refer back to the organisations used in 1.2 and get candidates to categorise them.</p>
1.4	Define and evaluate operational strategy within the organisation	<ul style="list-style-type: none"> <li>defining the operational strategy using SMART objectives and evaluating these in line with organisational objectives</li> </ul>	<p>Return to the work done earlier on objectives and ask the candidates to write objectives using SMART. At this stage it is useful to provide them with a couple of strategic objectives, perhaps taken from one of the organisations used previously, and ask them to devise some operational objectives that are aligned to these. From this, introduce the concept of operational plans to achieve objectives, again using SMART.</p> <p>Explain the importance of evaluating objectives to ensure that the organisational strategy will be met. Ask the group to identify some evaluation criteria that might be used; you may wish to introduce the 5 criteria suggested by Slack and others: appropriate, comprehensive, coherent, consistent over time and credible.</p>

1.5	Position operations within the organisation	<ul style="list-style-type: none"> <li>identifying links across different operational areas and the importance of having these work in synergy</li> </ul>	<p>Return to the original activity where candidates looked at vertical alignment. Through discussion, bring out that organisations are not just linear, rather they will have different departments or functions that create horizontal links. Discuss why these functions link and whether this link is formal or informal, leading to the concept of synergy between departments or functions to achieve quality products/services.</p> <p>Using an example from the organisations previously used, select three or more departments and ask the candidates to write down a principal objective for each, then ask them to identify the conflict that might exist between these. (Operations, Finance and Marketing are useful departments to use). Discuss who is responsible for maintaining these links and how this can be encouraged. Bring out the importance of communication here.</p> <p>It is useful at this stage to get the candidates to apply this exercise to their own organisations and share their findings.</p> <p>Using any of the weak links that have been brought out in the above exercises, get the candidates, in small groups, to identify why these have arisen and what can be done about it.</p>
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## UNIT 2: Identify supply chains in the organisation

**Recommended prior knowledge:** No prior knowledge is required for this unit, but candidates should be encouraged to reflect on the work done in the previous unit, which focuses on different types of operation, strategic and operational objectives and the importance of internal links.

Candidates should be encouraged to read around the subject and, in particular to look at the work of Slack et al, referred to in Unit 1. Equally, the web sites referred to in Unit 1 also apply here.

**Outline:** Identify supply chains in the organisation builds on the work done in Unit 1 and explores the concept of each section of the chain being both a supplier and customer of another part of the chain. In order to meet customer requirements and achieve a competitive edge, the concept of adding value is also explored.

COMPETENCE CRITERIA		EXPLANATION OF COMPETENCE CRITERIA	SUGGESTED TEACHING ACTIVITIES
2.1	Explain the concept of the customer-supplier chains	<ul style="list-style-type: none"><li>an awareness of all the stages in the operation both within the organisation and beyond, to customers and suppliers. How this can be used to identify disruptions or to add value</li></ul>	<p>Introduce Waller's definition of a supply chain (or similar). Link to the importance of the flow of information as well as products or services. Use real examples, possibly taken from the earlier organisations, to illustrate this diagrammatically. Bring out the concept of webs of supply chains, as illustrated by Slack and others.</p> <p>Introduce different types of supply chain, such as Naylor's inventory-based models.</p> <p>Ask candidates to consider the management responsibilities at each stage of the chain, then use group discussion to bring out the importance of working closely with all parties in the chain, both internal and external.</p>

<p><b>2.2</b></p>	<p>Identify the supply chains within and outside an organisation</p>	<ul style="list-style-type: none"> <li>• applying the above understanding in practice and identifying supply chains</li> </ul>	<p>Select a couple of organisations known to the candidates and ask them to devise a supply chain, then consider how effective this is and the implications for management at each stage. If there is time, you may wish to get the candidates to do this for their own organisations and share results.</p> <p>Look at key objectives: strategically the organisation should aim to drive the entire chain in the direction of satisfying customers. Now get candidates to consider the objectives to achieve this aim and what barriers are likely to arise. Extend the barriers to the global market and bring out the effects of external pressures.</p> <p>Introduce the concept of adding value to each stage in the chain, considering the different levels, then discuss value-added cells and the main ways to add value. You may wish to introduce Porter's value chain analysis, then get the group to apply this to one of the earlier examples used. Get them to identify what value-added effect each transformation has. Conclude this section by linking Porter's value chain concept with gaining competitive advantage. Get the candidates to now consider this for the previous activity.</p>
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### UNIT 3: Plan, schedule and manage operational capacity

**Recommended prior knowledge:** No prior knowledge is required other than that covered in Units 1 to 4 and candidates should be encouraged to reflect on the work done so far on suppliers and customers and the different types of operation. The use of Gantt charts is included, so the ability to use computer software to produce such charts would be helpful.

The following are useful resources to assist: Microsoft Project 2000 Step by Step, Microsoft Press International, Chatfield, C., (2000); Operations Management, FT Prentice Hall, Slack et al (2000; revised version 2003).

**Outline:** This Unit requires candidates to review different systems of planning and forecasting to achieve operational objectives, then to use scheduling tools, such as Gantt charts and other appropriate IT applications for planning operational activities. Techniques of forecasting are covered, as well as risk analysis and contingency planning.

COMPETENCE CRITERIA		EXPLANATION OF COMPETENCE CRITERIA	SUGGESTED TEACHING ACTIVITIES
3.1	Plan operations to achieve performance objectives	<ul style="list-style-type: none"> <li>approaches to planning operations</li> </ul>	<p>Introduce the concept of capacity and get the group to come up with some examples for the case study organisations. Differentiate between demand and load. Ask the group to identify what is meant by resources, bringing out: equipment and facilities, materials, staff and information and the effect of resources on capacity.</p> <p>Explain MRP (Materials requirement planning) and JIT (Just in time) and MRP2 (manufacturing resource planning) and how technology has enhanced these as planning techniques. Explain the difference between push and pull systems and use your case study organisations to illustrate these. Link this to waste reduction.</p> <p>Explain the concept of Kanban as a planning and control technique.</p> <p>Explore different approaches to capacity planning, such as chase demand planning, demand management, level capacity planning etc, again linking to the case study organisations.</p>

3.2	Schedule operations	<ul style="list-style-type: none"> <li>scheduling tools and techniques</li> </ul>	<p>Explain the MPS (master production schedule) and its importance in an organisation. Ask the candidates to identify the information required to devise an MPS. Link this to MRP.</p> <p>Differentiate between forward and backward scheduling, then introduce the Gantt chart as a planning tool. Get the candidates in small groups to devise a Gantt chart for a simple operation, such as a fast food outlet.</p> <p>Ask the group what could go wrong, leading to contingency planning.</p>
3.3	Forecast resource requirements	<ul style="list-style-type: none"> <li>techniques for forecasting the resources required to meet demand</li> </ul>	<p>Ask the group what is meant by forecasting and why it is used. Introduce techniques for forecasting, including judgemental, customer-based, predictive and causal. Using their own organisation or an example provided, ask the candidates to appraise the forecasting techniques used in terms of why they are used, what information they provide and the degree of accuracy.</p> <p>Explain how statistical analysis can be used in forecasting, giving examples from the case studies used.</p>

## UNIT 4: Set and control operational standards

**Recommended prior knowledge:** No prior knowledge is required for this unit, other than that covered in Units 1 to 3, however, it might be useful if candidates were aware of national and international control systems, such as ISO 9000, although this is not essential. Much of the content of this unit will have been covered in the Managing for Quality module, so, if this has already been completed, the candidates should be encouraged to review the work done, as it can be applied directly here.

**Outline:** Setting and controlling operational standards requires candidates to analyse processes, set standards of performance and develop processes and procedures for monitoring purposes. Established process control models are looked at and the communicating of such procedures is also covered. Candidates will be expected to identify the most appropriate process control and monitoring system for different operations.

*Introduce the 4-stage approach of: identifying the PROCESSES, setting the STANDARDS, MEASURING performance against standards and writing PROCEDURES to describe how the processes should be carried out.*

*Use this model to address the requirements of Unit 4.*

COMPETENCE CRITERIA		EXPLANATION OF COMPETENCE CRITERIA	SUGGESTED TEACHING ACTIVITIES
4.1	Analyse processes and set standards of performance	<ul style="list-style-type: none"> <li>using analysis techniques to identify strengths and weaknesses in the chain and set performance standards</li> </ul>	<p>Discuss what is meant by a process, then describe how to flow chart a typical process; again it is useful to use the previous case studies. Get the candidates to analyse a process, either from a case study you have provided, or from their own organisation, by creating a flow chart, then analysing it to identify the purpose of what is done, where, its sequence, who does it and the methods used. The aim here is to identify what is working well and what needs improving.</p> <p>Introduce established analysis models, such as Ishikawa fishbone, variation analysis, critical path and bottleneck identification and apply these to the activity above.</p>
4.2	Control operational standards of performance	<ul style="list-style-type: none"> <li>using quality control methods to ensure standards are being maintained</li> </ul>	<p>Explain the importance of having quality standards as a basis for measuring operational performance. Using previous case studies, work with the group to identify some known standards of performance, then introduce the concept of externally set process control standards, such as TQM, ISO 9000, Health and Safety etc. Include here any local or national standards and explain that these are often in addition to the customer-led</p>

			<p>standards.</p> <p>Having set the standards, it is then important to have a monitoring system. Introduce Statistical Process Control (SCP) as a means of getting individual departments or teams to take responsibility for standards of performance. Ask the candidates to identify how this could be used and the benefits to be gained.</p> <p>Explore process capability and the concept of tolerance levels, then ask the group to devise some monitoring systems for your case study example. Lead them into the use of control charts.</p>
4.3	Create and document procedures for systems and processes	<ul style="list-style-type: none"> <li>identifying and Establishing appropriate monitoring procedures and systems</li> </ul>	<p>Explain that once a process is working satisfactorily, it can be incorporated into a procedure. Refer back to established procedures, such as ISO 9000. Ask the group to identify what should be in a procedure, then get them to create one for the case study you have been working on. Discuss who should have access to the procedure and how it should be communicated.</p>
4.4	Communicate Quality Standards	<ul style="list-style-type: none"> <li>ensuring everyone is aware of the standards of performance expected</li> </ul>	<p>Lead into the importance of giving people the responsibility for quality of performance. This may involve issues such as team briefs, delegation, empowerment, a customer-led or quality culture. The key issue is communication and you may wish to get the candidates to consider issues of communication in the case study example and their own organisations.</p> <p>Bring out: quality circles, improvement groups and Kaizen as ways of communicating and controlling quality. You may also introduce the five Ss from Japan as a quality improvement tool.</p>

## UNIT 5: Manage resource requirements and use

**Recommended prior knowledge:** No prior knowledge is required, but candidates should be encouraged to reflect on the work done in the previous units. Issues of managing people are included here and the work done on the Managing Teams module will be useful here. It might be useful to encourage candidates to review the work done on Evaluating Team Performance, as much of it will apply here. Equally, work done in the Managing Finance module could be useful when looking at inventory costs.

**Outline:** This unit looks at all the resource implications of managing operations: the human resource, the material resource and the capital resource. Candidates are required to review the skill mix of the staff in order to allocate tasks, control inventory in a cost-efficient manner and purchase and maintain equipment and facilities in line with operational demands and health and safety considerations.

COMPETENCE CRITERIA		EXPLANATION OF COMPETENCE CRITERIA	SUGGESTED TEACHING ACTIVITIES
5.1	Manage people, the human resource	<ul style="list-style-type: none"> <li>planning the staff to meet the demands, including matching skills to tasks</li> </ul>	<p>Using one of the case study organisations, get the group to list the key people skills required to meet the operational demands. Group the responses into technical competence, management skills and interpersonal skills. Discuss the relative importance of each of these according to the operational demands. Introduce a skills matrix and show how this can be used to plan staff needs and manage it. Link to utilisation of strengths and the need for training and development.</p> <p>Explore key issues around allocation of tasks to individuals in terms of the nature of the task, the customer relationship, the level of skill required and the equipment to be used.</p> <p>Devise a team activity for the group with clear outcomes and ask them to complete a skills matrix and allocate tasks. Having completed this and the team activity, ask them to review how well their people planning skills were.</p> <p>Use this exercise to explore flexible approaches to managing the people, such as multi-skilling and changes in work practices. Link all of this to the forecasting activities carried out previously.</p>

5.2	Manage inventory or stock, the material resource	<ul style="list-style-type: none"> <li>planning and maintaining the materials and stock required to meet the demands</li> </ul>	<p>Using the case study organisations, ask the group to list examples of inventory, stock or materials held by them. Distinguish between different types of inventory and why these are held. Return to the case studies and get the candidates to identify inventory and why it is held.</p> <p>Generate discussion around the costs associated with inventory and ask the group to come up with ideas for controlling costs. Here you can link to JIT and introduce EOQ (economic order quantity) and the importance of having good relationships with suppliers.</p>
5.3	Manage equipment and facilities, the capital resource	<ul style="list-style-type: none"> <li>planning and managing the facilities, including equipment, to meet the demands</li> </ul>	<p>Brainstorm what is meant by equipment and facilities. Discuss how equipment is selected and what the trends are towards automation.</p> <p>Discuss the links between equipment and the layout of facilities and the effect on operations; bring out functional and cellular layouts, assembly lines and continuous flow. Again you will be able to draw on the case study organisations. Compare this with service layouts. Get the candidates to appraise some familiar layouts in terms of effectiveness, utilisation of space, safety and customer requirements.</p> <p>Stress the importance of having all equipment working properly and introduce different approaches to maintenance, including scheduling, preventative maintenance and total productive maintenance (TPM). Here you could introduce relevant rules and regulations regarding health and safety.</p> <p>Discuss the need to reduce cost and waste and the different approaches to this; using the case study organisations, get the candidates to identify possible sources of waste and strategies for reducing this. Explore cost savings to the organisation as well as the positive impact on the environment (internal and external).</p>