

## UNIT 4: Operations Management

**Recommended prior knowledge:** None – but some students may have covered some of these topics at IGCSE. The issues and concepts are introduced assuming that there is no prior knowledge.

**The unit in context:** This Unit introduces production related issues. The impact that decisions made in other departments have on Operations needs to be made clear e.g. a marketing campaign may well require an increase in output. Similarly, the effect that Operations Management decisions can have on other functional areas must be stressed e.g. the use of computer operated machinery and the impact on human resources and training needs.

**Outline:** The Unit covers the main areas of Operations decision making such as location, production methods, costing methods and stock management systems. There is some numerical work but the more complex examples are only covered in the additional work for A level.

Learning Outcomes	Suggested Teaching and Student Activities	Resources	Online Resources
<b>a) Nature of production</b>			
<p><b>Students should be able to:</b></p> <p>i.) understand that production is about converting inputs to outputs and adding value in the process</p> <p>ii.) recognise that local labour market conditions may act as a constraint on production decisions</p> <p>iii.) understand the concept of productivity and how this affects unit costs.</p> <p>iv.) understand the importance of the location decision for new and existing businesses</p> <p>v.) evaluate the relative importance of certain factors in influencing the location decision.</p>	<ul style="list-style-type: none"> <li>a well organized factory visit would be an ideal starting point. There is also a case to be made for arranging this towards the end of this Unit when students have gained a good understanding of the theories involved. Two visits allowing comparisons between job/batch and flow production would be ideal.</li> <li>contact with local firms and shops to discover reasons for location in the area. Case study exercise could be drawn up with two different locations for one business and groups asked to argue for one location or another.</li> </ul>	<ul style="list-style-type: none"> <li>class notes or photocopied notes needed.</li> <li>Stimpson: Chapters 20 and 22 and activities on Westlife jeans, Motorola, German efficiency.</li> <li>Barratt and Mottershead: Units 23 and 24 and case study on page 282</li> <li>Jewell: Chapter 35</li> <li>9707/1 Nov 2002 Q7</li> </ul>	<ul style="list-style-type: none"> <li>use the general websites referred to in the introduction for details of notes and activities in the Operations Management area.</li> <li>for location try government web sites to investigate incentives available for businesses to locate in a country e.g. <a href="http://www.investinspain.org">www.investinspain.org</a> ; <a href="http://www.economy.gov.eg">www.economy.gov.eg</a> ; and <a href="http://www.saudinf.com">www.saudinf.com</a> .</li> </ul>

	<ul style="list-style-type: none"> <li>• contact employment agencies to discover local labour market conditions. Are there shortages of labour that could be restricting growth of local firms?</li> <li>• simple numerical examples of labour productivity and impact on unit costs should help to drive home these points.</li> <li>• students own work experience might be useful to allow discussion of the nature of production.</li> </ul>		
<p>vi.) analyse the production process from Research and Development through to the final product.</p> <p>vii.) analyse the differences between capital and labour intensity and justify the appropriateness of each in different circumstances</p>	<ul style="list-style-type: none"> <li>• refer back to Research and Development section in Marketing. Why does Research and Development sometimes fail? Students need to be able to evaluate whether Research and Development spending is always beneficial.</li> <li>• ask for examples of different industries – service industries often labour intensive – students should be able to explain why.</li> </ul>		<ul style="list-style-type: none"> <li>• <a href="http://www.Ford.com">www.Ford.com</a> gives details of the Ford Motor Company's use of innovation</li> </ul>

<b>b) Organising production</b>			
<p><b>Students should be able to:</b></p> <p>i.) understand how work study might be introduced and the possible benefits of it</p> <p>ii.) recognise the different methods of production e.g. job, batch, flow</p> <p>iii.) understand the concept of capacity utilization and calculate it from given data.</p> <p>iv.) define and recognize different classifications of costs and understand the need for accurate cost data</p> <p>v.) understand the concept of break-even and calculate it using formula and construct a simple break even chart</p>	<ul style="list-style-type: none"> <li>• this section of the Unit contains key issues and will take up a good deal of time</li> <li>• simple exercise in class of timing students performing a task – and trying to suggest an improved method of doing it.</li> <li>• explain the 3 main types of production but also refer to recent trends in cell production and mass customisation. A simple production game in class can demonstrate the essential differences between the production methods.</li> <li>• numerical examples of capacity utilisation – and the implications to a business of operating at full and less than full capacity (use the school as an example).</li> <li>• cost classifications need to be explained carefully – students should be able to come up with own examples (again taken from school?)</li> </ul>	<ul style="list-style-type: none"> <li>• Stimpson: Chapter 20,21 and start of 22. Activities on Sunburst bakeries, Cessna aircraft, Windcheater, Heath electronics, Onyx garages, Bureau office supplies,, Cosmic cases, Midtown Hotel. Try revision exercises at end of these chapters too.</li> <li>• Barratt and Mottershead: Units 27 and 42. case studies on pages 317 and 489.</li> <li>• Jewell: Chapters 33 and 38 and exercises at end of these.</li> <li>• 9707/2 Nov 2001 Q2(a) and Q2(c)</li> <li>• 9707/3 June 2002 Q(d)</li> <li>• 9707/1 Nov 2001 Q6</li> <li>• 9707/2 June 2003 Q2(b)</li> <li>• 9707/1 June 2002 Q7</li> </ul>	<ul style="list-style-type: none"> <li>• IGCSE CD-Rom for production activities.</li> <li>• the break even topic at <a href="http://www.osl-ltd.co.uk">www.osl-ltd.co.uk</a> might be useful or try the general web sites referred to in the Introduction.</li> </ul>
<p>vi.) <i>scale of Operation</i></p>	<ul style="list-style-type: none"> <li>• <i>discuss how less than full capacity can cause problems for the business and evaluate ways of dealing with this problem.</i></li> </ul>		

<p>vi.) evaluate the usefulness of this technique</p> <p>vii.) understand the principles of effective stock management and be able to describe methods of stock management such as JIT</p>	<ul style="list-style-type: none"> <li>• explain the idea of break even and its importance. Simple charts – students need to be able to draw up and amend these with additional information. Give as many examples as possible where different charts can be drawn on the basis of two decision options. Students should be able to analyse charts to help make decision. The advantages and disadvantages of this technique must be explained and noted.</li> <li>• discussion on costs and benefits of high stock levels for different types of businesses</li> </ul>		
<p>viii.) Evaluate the appropriateness OF production methods in different situations</p> <p>ix.) evaluate ways of increasing a firm's capacity utilisation</p> <p>x.) understand costing methods and do calculations based on these.</p> <p>xi.) evaluate absorption and contribution costing.</p>	<ul style="list-style-type: none"> <li>• use knowledge of production methods to evaluate appropriateness in different production situations.</li> <li>• costing methods best taught by using simple numerical examples of cost /profit centres.</li> </ul>		

c) Operational efficiency			
<p><b>Students should be able to:</b></p> <p>i.) understand the causes and significance of economies and diseconomies of scale</p> <p>ii.) understand the principles of lean production and why greater productive efficiency is so important.</p> <p>iii.) suggest ways in which lean production might be implemented.</p>	<ul style="list-style-type: none"> <li>• after defining and explaining students should be able to think of examples taken from, say, retailing or the school. Important not to overlook diseconomies – what happens when school become too large?</li> <li>• lean production – this could have been experienced in the factory visit. Notes on what the principle means and how it might be achieved in practice. The importance of competitiveness in today's world needs to be stressed. Link in with People section as changes in Ops Man strategies will always have "people" effects.</li> </ul>	<ul style="list-style-type: none"> <li>• Stimpson: Chapter 22 and 23. Activities include Bookworm, Nassau Textiles, Sportswize, Nissan, Haisho and Kaizen.</li> <li>• Barratt and Mottershead: Units 28 and 30 and case studies on pages 327 and 348.</li> <li>• Jewell: Chapter 36, 39 and exercises at end.</li> <li>• 9707/3 June 2003</li> <li>• 9707/1 June 2003 Q7</li> <li>• 9707/2 June 2003 Q1(a) and Q2(a)</li> <li>• 9707/1 June 2001 Q5</li> <li>• 9707/2 June 2001 Q2©</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="http://www.kaizen.com">www.kaizen.com</a> is a site created to promote the concept of continuous improvement.</li> </ul>
<p>iv.) <i>evaluate the principle of lean production and discuss the appropriateness of lean production (e.g. JIT) in different circumstances.</i></p>	<ul style="list-style-type: none"> <li>• <i>discussion on how appropriate JIT; time based management etc. might be to different businesses in different production situations.</i></li> </ul>		

<b>d) Quality control and assurance</b>			
<p><b>Students should be able to:</b></p> <p>i.) explain the main methods of quality control and explain the importance of quality to a business.</p>	<ul style="list-style-type: none"> <li>ask for definitions of “quality” – why does it not always mean the “best possible”.</li> <li>how would students like to have the quality of their work checked – by control methods or self checking?! Discuss problems of poor quality.</li> </ul>	<ul style="list-style-type: none"> <li>Stimpson: Ch.24 and activities on Trinidad Tractors, CaribSugar, Defects at Wheelers.</li> <li>Baratt and Mottershead: Unit 29 and case study page 336</li> <li>Jewell: Ch. 37 and essay questions on page 441 (mainly for class discussion).</li> <li>9707/1 Nov 2001 Q3</li> </ul>	<ul style="list-style-type: none"> <li><a href="http://www.piqc.com.pk">www.piqc.com.pk</a> is the web site for the Pakistan Institute of Quality Management. It contains details of courses that it runs and case studies of quality management in business are available if you e-mail them.</li> </ul>
<p>ii.) analyse and evaluate continuous improvement, Total Quality Management, quality assurance standards and benchmarking.</p>	<ul style="list-style-type: none"> <li>the modern approaches to quality can be tied in with HRM – empowerment and cell production are often linked to TQM.</li> <li>factory visit would be helpful for this section.</li> <li>discuss how the school might “benchmark” its performance against the best in the sector.</li> </ul>		
<b>e) Production planning</b>			
<p><b>Students should be able to:</b></p> <p>i.) understand the need for planning of time and resources in the production process</p> <p>ii.) draw and interpret simple network diagrams (Critical Path Analysis)</p> <p>iii.) calculate and interpret activity float times.</p>	<ul style="list-style-type: none"> <li>ask students to list the activities involved in a simple task e.g. making a cup of coffee. Draw up these activities into a simple network</li> <li>move on to more complex examples examining the uses of the technique e.g. identifying critical path, non critical activities and allocating resources more efficiently.</li> <li>explain how EST and LFT are obtained and explain float times. Calculations of these are essential (simple only)</li> </ul>	<ul style="list-style-type: none"> <li>Stimpson: Chapter 24 and activities on pages 383,385,387.</li> <li>Barratt and Mottershead: Unit 31 and case study on p 360 (Note: Gantt charts are covered in this book but are not required on this syllabus)</li> <li>Jewell: Unit 40 and exercises at end of chapter.</li> <li>9707/3 Nov 2002 Q(d)</li> </ul>	