Planning Activity

Theme 2

This document provides an example of a plan for one topic within Theme 2. This resource goes into more detail than is required in the specification but it provides some background to the topic and suggested approaches for planning content.

The approach to planning taken in this document was to:

- Identify the specification content and possible links to other topics in the specification
- Identify the knowledge, application, analysis and evaluation relevant to that content
- Identify resources to support delivery – these might include:
    - Support resources including sample assessment materials and Getting Started guide
    - Published resources including textbooks
    - Websites and news stories
- Develop activities and resources – these might include:
    - Questions from past papers
    - Worksheets
    - Past and new case studies
    - Practice questions for a range of question types – explain, calculate, assess and evaluate (where appropriate)

Capacity utilisation

Specification content	2.4.2 a) Capacity utilisation: current output (divided by) maximum possible output (x 100) b) Implications of under- and over-utilisation of capacity c) Ways of improving capacity utilisation
Possible specification links	1.3.5 Marketing strategy – may be needed to increase demand so that capacity utilisation can be increased e.g. promotion
	1.4.1 Link between capacity utilisation and staffing requirements – more temps/overtime if short term Higher capacity utilisation might strengthen the hand of employees in pay negotiations.
	1.4.2 Link between changes in capacity utilisation and recruitment needs
	2.2.1 Link between sales forecasts and capacity requirements
	2.2.2 Impact on average fixed costs i.e. lower capacity utilisation will raise AFC
	2.2.3 Links between working at low capacity utilisation levels and operating below break-even point
	2.4.1 Link with productivity
	3.1.2 Achieving a competitive cost advantage through high capacity utilisation than rivals Impact of strategic decisions on capacity requirements and utilisation
	3.1.3 Could figure in SWOT analysis as strength or weakness
	3.5.3a) Impact on absenteeism/turnover of working at higher capacity Impact on productivity
	4.2.1 Seeking markets overseas as a way of increasing capacity utilisation

Knowledge, application, analysis and evaluation

Knowledge	'Homework' and 'Miah Enterprises Ltd.' examples (slides 1–9) Define capacity utilisation in max. 140 characters (Tweet) Activity 1: Fill in the gaps (also see slides 17–20) Activity 2: True or false? (also see slide 21)
Application	'Make up your own business' example (slides 10–12) Activity 3: Calculations (also see slides 22–25) The capacity idea at Heathrow: http://www.bbc.co.uk/news/business-21496856 Room occupancy rates in hotels: http://www.berkeley-scott.co.uk/hospitality-matters/hotels/london-hotel-occupancy-rates-soar-in-september Data on hotel occupancy rates: http://www.hotstats.com/ Case study 1: Boeing, Boeing Case study 2: Capacity Utilisation 2012
Analysis	Low capacity utilisation: causes, consequences, problems (slides 13–15) Case study 1: Boeing, Boeing Case study 2: Capacity Utilisation 2012
Evaluation	Is low capacity always a problem? (slide 15) Is full capacity always a good thing? (slide 16) Case study 1: Boeing, Boeing Case study 2: Capacity Utilisation 2012

Lesson ideas: pick and mix

Starter – discussion	Use 'homework' example: actual and possible (slides 1–5)	K, Ap
Listening	Explanation of 'Homework' example (slide 5)	K, Ap
Listening	YouTube clip: https://www.youtube.com/watch?v=Yjhjg0MUyhU	K, Ap, An
Writing	Formula then terms by answering a–c (slide 6)	K, Ap
Listening	Explanation of impact on fixed cost per unit Explanation of impact on unit costs and profit (slides 8–9)	K, Ap
Writing	Answer d–g (slide 7)	K, Ap
Writing	'Make up your own business' example with the same 5 bits of information (slide 10)	K, Ap
Pairwork	Swap examples with partner: answer a–g on your partner's example (slide 11)	K, Ap
Discussion	The capacity idea at Heathrow: http://www.bbc.co.uk/news/business-21496856	Ap
Discussion	Room occupancy rates in hotels: http://www.berkeley-scott.co.uk/hospitality-matters/hotels/london-hotel-occupancy-rates-soar-in-september	Ap
Collect and analyse data	Data on hotel occupancy rates: http://www.hotstats.com/	Ap, An
Tweet	Define capacity utilisation in max. 140 characters	K
Listening	Is full capacity always a good thing? (slide 16) Low capacity utilisation: causes, consequences, problems (slides 13–15)	An, Ev
Recap	Activity 1: Fill in the gaps (also see slides 17–20)	K
Detailed case study	**Either** Case study 1 **or** Case study 2 (needs 30 minutes)	Ap, An, Ev
Review	Answers to case study above Activity 2: True or false? (also see slide 21)	K, Ap, An, Ev

Homework	**Either** Activity 3 **or** a case study (whichever one not used before)	

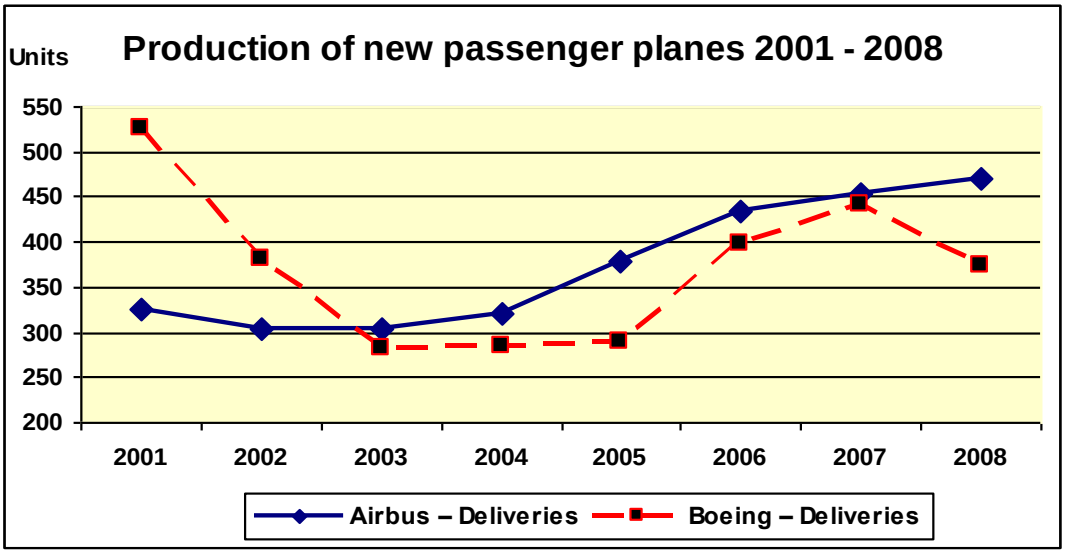
The case studies and activities which follow have all been produced by Ian Marcousé. They are available in our resource bank.

Case study 1

Boeing, Boeing …

In December 2008 many industries were reporting extraordinary sales declines. Some responded by halting production temporarily; others by redundancies, for example at Nissan's Sunderland factory. Many firms could learn a huge amount by looking at the industry with the sharpest ups and downs in sales – aircraft manufacture. In recent years, sales of Boeing passenger planes have varied from 176 to 1,422 (8 times as high). How can you run a big business in which capacity utilisation can vary so dramatically?

The problem of capacity utilisation is simple. If you build a factory to produce 500 planes, huge fixed costs are involved in the floor space, the machinery, the salary bill and the maintenance. The fixed costs may be high, but that will be no problem if the factory is fully occupied, because the costs will be spread across 500 planes. If fixed costs are £600 million, each plane can carry £600m/500 = £1.2 million of fixed costs. But if a downturn means only 200 planes are wanted, the fixed costs per plane jump to £600m/200 = £3 million per plane. As implied by the graph, Boeing may be hit by this problem in the next year or two.



Between 2005 and 2007, Boeing thought it was going to recover its traditional lead over Airbus. Then came 2008 with a collapse of orders (from an all-time peak in 2007). Worse, for Boeing, was a 6-week strike at its production base at Seattle. This hit its ability to deliver to its customers.

This made a bad position even worse. Already Boeing had been struggling to keep up with booming orders for its brand new 'Dreamliner' large plane. From the start it had decided to build less of the plane itself, and rely more on suppliers. It 'outsourced' production to suppliers from around the world, but then found quality and reliability problems when the parts arrived in Seattle for assembly.

In early 2009, Boeing told Virgin that its orders for 'Dreamliner' planes would be delivered about two and a half years late – in Autumn 2013 instead of Spring 2011!

In the meantime the European aircraft producer Airbus was showing Boeing a thing or two about production efficiency. In 2008, it met its planned output of 12 A380s (the massive, double-decker plane costing more than £200 million each). Better still, it continued with the steady build-up of production (deliveries) that began in 2002 (see Appendix A). Even when orders quadrupled in 2005, Airbus built up its capacity steadily, to ensure that its capacity utilisation was never too high or too low. Even though 2009/2010 will be the toughest period for manufacturing firms for at least 35 years, Airbus looks a certain survivor.

Appendix A. Orders and deliveries for the world's two key aircraft manufacturers

	2001	2002	2003	2004	2005	2006	2007	2008
Airbus – New Orders	375	300	284	370	1111	824	1,458**	756*
Boeing - New Orders	335	176	249	276	1,022	1,054	1,422	662
Airbus – Deliveries	325	303	305	320	378	434	453	470
Boeing – Deliveries	527	381	281	285	290	398	441	375

*Up until Nov 30th 2008, i.e. only 11 months

**Airbus says these orders were worth £181.1 billion, i.e. an average price of £124m per plane!

In the longer term, Boeing and Airbus have to expect more competition. For years they have carved up nearly 100% of global plane-making between the two of them. In the future, China, Japan and Russia are determined to break into this multi-billion-dollar business. That may be when the aircraft business gets really interesting.

Questions

1a) Use the graph to help explain why capacity utilisation appears to be more of a problem to Boeing than to Airbus. (5)

1b) Explain why low capacity utilisation would be a particular problem for a manufacturer of planes. (5)

2. Assess the possible impact on Boeing of delivering aircraft to Virgin Airways two and half years behind the agreed delivery date. (8)

3. Assess whether it must always be wrong to 'outsource' production, when the quality of the product is crucial, as in the case of manufacturing aircraft. (12)

Mark scheme: Capacity utilisation

1a) Use the graph to help explain why capacity utilisation appears to be more of a problem to Boeing than to Airbus. (5)

Possible themes might include:

Airbus deliveries of airplanes have been quite stable, largely rising each year, especially between 2003 and 2008. This would make it quite easy to make good use of the firm's capacity.

Boeing seems to suffer from much sharper ups and downs, making production far more erratic; this would make it hard to manage capacity utilisation effectively. For example, capacity cutbacks to cope with the halving of deliveries between 2001 and 2003 would have made it very difficult to cope with the upturn in 2005/06.

1b) Explain why low capacity utilisation would be a particular problem for a manufacturer of planes. (5)

Possible themes might include:

The problem with low capacity utilisation is that fixed operating costs remain unchanged, and therefore have to be spread over fewer units of output; as a result, average unit costs rise (squeezing or eliminating profit margins). As aircraft manufacture implies huge fixed costs such as vast assembly areas and highly trained staff, low capacity utilisation is especially punishing.

2. Assess the possible impact on Boeing of delivering aircraft to Virgin Airways two and half years behind the agreed delivery date. (8)

Possible themes might include:

Virgin would be within its rights to cancel the order; if it decided that the 2009 recession made it too risky to buy these expensive new planes, the late delivery would enable them to cancel without suffering a penalty (such as a lost deposit).

Even if Virgin decides to accept these planes, there are many serious consequences. Virgin itself will be wary, in future, of accepting Boeing's word; therefore Boeing will have to offer higher discounts in future to secure Virgin's business.

3. Assess whether it must always be wrong to 'outsource' production, when the quality of the product is crucial, as in the case of manufacturing aircraft. (12)

Possible answers include:

Outsourcing is always controversial; some people seem to believe it improves quality and efficiency, perhaps because the new suppliers are in constant fear of losing the contract, but there is little evidence that fear is a successful motivator.

The main case against outsourcing is that only staff who are building long-term careers at a business are likely to *really* care about quality; others will do enough to tick the box headed 'quality', but will never care.

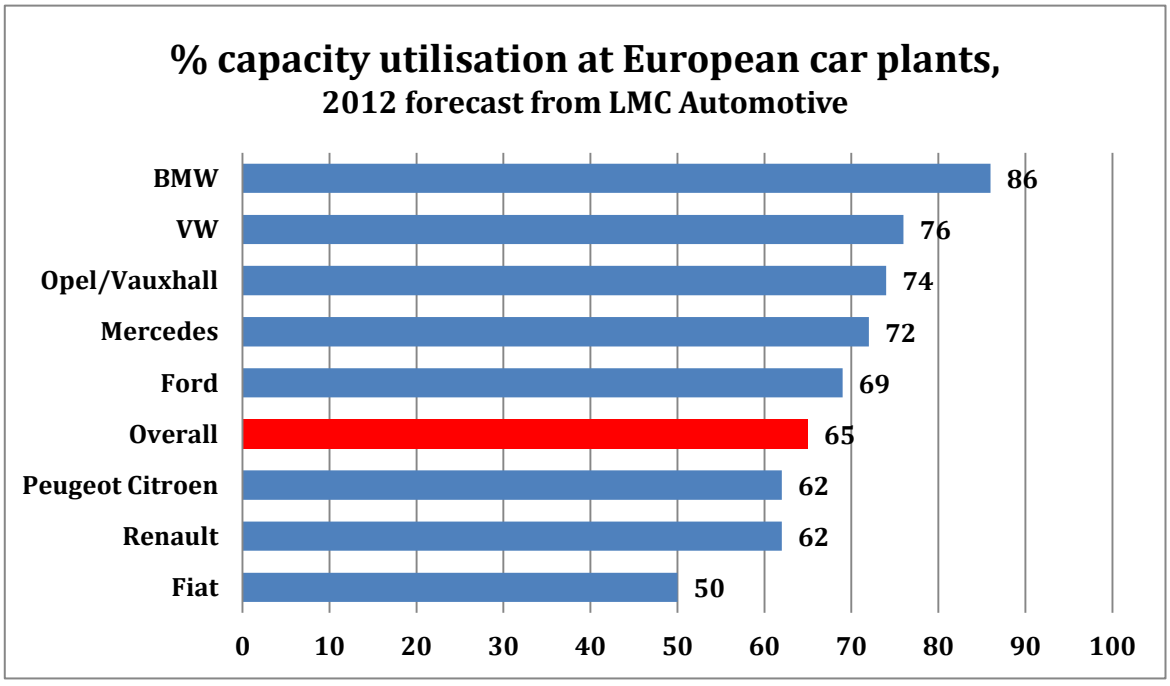
With aircraft production there is no room for error; if outsourced production of the aircraft undercarriage was done poorly, the consequences for lives and for the manufacturer's reputation are obvious. Others will argue that careful quality checks should be enough to feel confident of outsourced production.

Case study 2

Capacity Utilisation 2012

In early February 2012, industry experts LMC Automotive presented the following forecast of capacity utilisation at European car plants owned by European car companies. The average rate of capacity utilisation is 65% – far below the comparable figures for American car factories. The reason for this is that whereas many American car factories were closed down in 2009 (when recession hit), European car plants were kept open. Despite the slow pace of economic recovery since 2009, low capacity levels in America have allowed companies such as General Motors and Chrysler to return quickly to profitability.

In Europe the position is much more difficult for firms such as Renault and Fiat – neither of which has broken into China, the world's biggest car market. By comparison, BMW and VW's success is largely due to their strong position in China. The economic problems within the Eurozone make China particularly important, especially perhaps for Fiat, as Italy's economic position is the most difficult among Europe's main car manufacturing countries.



Questions

1. Briefly explain:

a) why America's car industry has 'low capacity levels' (3)

b) how America's car industry now benefits from 'low capacity levels'. (3)

2. Analysts have suggested that BMW's capacity utilisation level is 'ideal'.

Explain why that may be so. (6)

3. At its European car factories, Fiat is forecast to have a 50% capacity utilisation level.

Explain how this is likely to affect the company's profit level. (6)

4a) Assess two ways in which Fiat might try to change its level of capacity utilisation. (8)

4b) Assess which strategy might prove better for Fiat in the long term. (12)

Mark scheme: Capacity utilisation

1. Briefly explain:

a) why America's car industry has 'low capacity levels' (3)

Closing factories in 2009 means their maximum capacity levels are now relatively low.

b) how America's car industry now benefits from 'low capacity levels'. (3)

With low maximum capacity levels, quite small increases in demand (at a time of slow economic recovery) can push output towards maximum capacity, thereby cutting fixed and total costs per unit (as fixed costs are spread over more units of output).

2. Analysts have suggested that BMW's capacity utilisation level is 'ideal'. Explain why that may be so. (6)

Capacity utilisation must be high enough to ensure that the fixed costs (the factory rent; the depreciation on the machinery and the salaries of permanent staff) are spread thinly across plenty of output that keeps the average costs down, making it easy to generate profits...

... but if capacity utilisation is close to 100% there is no margin for error, so a machine breakdown can lead to supply shortages and therefore unhappy customers, as can a one-day strike by staff.

86% is far enough ahead of its rivals to represent a competitive advantage without being so high as to threaten service reliability.

3. At its European car factories, Fiat is forecast to have a 50% capacity utilisation level. Explain how this is likely to affect the company's profit level. (6)

The maths is easy: 50% capacity utilisation means that fixed costs per unit (average fixed costs) will be twice as high as at full capacity; this is likely to mean that the factory operates at a long way below its break-even point and therefore loses money (makes an operating loss).

It is literally the equivalent of looking around a Jumbo Jet and seeing half the seats empty; there will be the same number of crew on the plane – and the same amount of fuel used – but the fixed operating costs are being covered by half the number of passengers.

4a) Assess two ways in which Fiat might try to change its level of capacity utilisation. (8)

The first option is to cut capacity, for example by closing one of three factories, or even considering closing two out of four. This might be very costly – and difficult – in the short term, with protests and perhaps strike action by staff, and heavy write-offs on machinery that is perhaps worth no more than the scrap metal price; once completed, though, this approach solves any long-term problem of weak demand.

The second option is to try to boost demand, i.e. improve factory utilisation by getting more customers to buy the cars. This might be possible if Fiat had an innovative, attractive new model to launch – perhaps an electric-powered 4x4 model; if there is no such breakthrough product in the pipeline, then stimulating demand is likely to boil down to either price cuts or an advertising/promotion-based route to higher sales. Both can be expensive, and must be repeated every year to stimulate demand and keep that utilisation level up.

4b) Assess which strategy might prove better for Fiat in the long term. (12)

It is hard to say without further information, but it is pretty clear that Italy has a medium-long term economic problem within the Eurozone, making it sensible to recommend a strategy that best suits medium-long term requirements.

If Fiat keeps its current capacity level it may have year after year of trying to boost demand beyond its 'natural level', for example by special offers or long period of interest-free credit to customers; the only exception to this is if its managers truly believe they have a new product that can gain a significant amount of market share (given that market size in Europe is likely to remain subdued); such a product would have to be as significant as the Qashqai model has been to Nissan.

A cautious management would probably bet that any new products are likely to be matched by the new products of rivals, leaving market share largely unchanged. If so, the only solution is to cut capacity, probably by closing down its least-productive, oldest technology plants. The short-term pain (and cost) could then turn into a medium-long term bonus, if Fiat ends up in the same position as the US car industry, i.e. slowly-rising sales proving profitable because low capacity leads to high capacity utilisation.

Capacity utilisation and intensity

Activity 1: Fill in the gaps

Capacity is the v_____ of output a firm is capable of producing. Capacity utilisation measures actual output as a percentage of the firm's capability. If the maximum capacity is 10,000 units a month and the actual output is 6,500 units, capacity utilisation is _____%. As fixed (o_____) costs are related to maximum capacity, if the firm has low capacity utilisation, its fixed costs per unit will be _____ and so too will be its average total costs per unit.

Capital intensity raises a separate issue. To what extent are the total costs of the business weighted towards fixed capital (such as machinery)? Or is the business labour intensive, i.e. do labour costs form a high proportion of total costs? The former case is more likely to be true of large firms (especially in the manufacturing sector) whereas the labour intensive firms are more likely to be _____ firms especially in the _____ sector.

Activity 2: True or false?

1. Low capacity utilisation means low unit costs.
2. Low capital intensity means high labour costs per unit.
3. High labour intensity may mean high costs but high flexibility and good customer service.
4. High capacity utilisation keeps unit costs down as machinery and staff are being used productively.
5. An increase in capital intensity might lead to redundancies.

Activity 3: Calculations

3.1 Six months ago, John Collins started up a retail business with overheads of £4,000 per week, including £900 on staff, £700 on rent and the rest on the cost of leasing a state-of-the-art automated supply system. This enables customers to order over the phone, the internet or in person, and a robotic stock-picking system finds the item and delivers it to a collection bay. Current unit sales of 7,200 per week are close to the system's maximum capacity of 8,000 units.

a) Calculate the firm's % capacity utilisation.

b) Calculate the capital intensity of John Collins' business.

c) A rival retailer has a labour intensity of 70%. Identify one advantage and one disadvantage to John Collins of its capital intensity.

3.2 JT Co's fixed overheads of £600,000 a month pay for a maximum capacity of 200,000 units. Variable costs are £2 per unit, the selling price is £8 and current demand is for 120,000 units.

a) What is JT Co's capacity utilisation?

b) Calculate JT Co's fixed costs per unit at 120,000 units and at maximum capacity.

c) Explain how the above data enables you to know that JT Co's profit margin is £1 per unit at sales of 120,000 units, but £3 per unit at maximum capacity.

d) Calculate the % increase in the firm's total profit that would result from a sales increase from 120,000 to 200,000 units.