

Operational decisions and targets

OPERATIONS MANAGEMENT is the organisation and control of the process by which inputs, such as labour, materials and machinery, are transformed into final products or by which services are provided to customers. Production managers, for example, are responsible for making decisions about:

- what production methods are to be used;
- what levels of input of labour, machinery and materials are needed to produce a given quantity of output;
- how best to utilise the firm's capacity;
- what stock levels are required to support production;
- how to ensure that work is completed on time;
- how best to ensure quality.

Decisions about the entire business that affect production also need to be made. For example:

- What is the optimal size for a business? Should there be five employees, 500 or 500,000?
- Where should production take place? On one or two sites? In the UK or the Far East?

Good operations management can help a business to be more effective. One approach which operations managers are likely to use is to set OPERATIONAL TARGETS. Setting targets can help managers monitor the performance of the production department. A number of key targets might be used, as shown in Figure 1.

Unit costs

Unit cost is the cost of producing a single unit of output. It is the same as average cost. It can be calculated as:

$$\text{Unit cost} = \frac{\text{Total cost}}{\text{Output}}$$

So, for example, if a computer manufacturer produced 12,000 laptop computers in a year at a total cost of £3,480,000, the unit cost would be given by:

$$\text{Unit cost} = \frac{£3,480,000}{12,000} = £290$$

This means that each single laptop computer cost £290 to make.

Production managers may set operational targets for unit costs. These costs can be measured at the end of a production run and compared with the targets. If actual unit costs are higher than the targets, the production manager is likely to search for reasons why so that appropriate action can be taken. Generally, businesses are always looking for ways to *control* or reduce unit costs.

Figure 1: Operational targets



Capacity utilisation

CAPACITY UTILISATION is about the use that a business makes from its resources. If a business is not able to increase output, it is said to be running at full capacity. Its capacity utilisation is 100 per cent. So if a 52 seater coach from London to Edinburgh has 52 passengers, it is operating at full capacity. If it had 32 passengers it would be operating at less than full capacity and so it would have EXCESS, SURPLUS, SPARE or UNUSED CAPACITY.

Businesses do not always operate at full capacity. It may not be possible to keep all resources and machinery fully employed all the time. However, most businesses would wish to be operating at close to full capacity, such as 90 per cent.

In some cases businesses even choose to operate at less than full capacity in order to be flexible. For example, they might want to have capacity to cope with increased orders from regular customers. Without this, a business might let down its customers and risk losing them.

Capacity utilisation can be measured by comparing actual or current output with the potential output at full capacity using the formula:

$$\text{Capacity utilisation} = \frac{\text{Current output}}{\text{Maximum possible output}} \times 100$$

A printing operation might be able to operate for ten hours, six days a week using shifts. If it only had enough work to operate for 48 hours last week, the capacity utilisation would be:

$$\text{Capacity utilisation} = \frac{48}{(10 \times 6)} \times 100 = 80\%$$

Capacity utilisation

Another example might be a printing machine that is capable of printing 10,000 leaflets in a time period but only prints 9,000. It has a capacity utilisation of $(9,000 \div 10,000) \times 100 = 90$ per cent. In this case the machine has unused, excess, surplus or spare capacity of 10 per cent.

Costs and capacity utilisation

A business can lower its unit or average costs if it can increase its capacity utilisation. This is because some of its costs are fixed. Higher levels of capacity utilisation and higher levels of output, will make a business more efficient. Table 1 shows capacity utilisation output, variable cost, fixed cost, total cost and average cost (unit cost) for a component manufacturer. When capacity utilisation is raised from 60 per cent to 80 per cent, for example, average cost falls from £2.42 to £2.31. This is because the fixed costs of £50,000 are spread over more units of output. This explains why firms will always be keen to raise capacity utilisation.

Table 1: Capacity utilisation, output, variable cost, fixed cost, total cost, unit cost for a component manufacturer

Actual output (units)	120,000	160,000
Maximum possible output (units)	200,000	200,000
Capacity utilisation	60%	80%
Variable costs (£2 per unit)	£240,000	£320,000
Fixed costs	£50,000	£50,000
Total cost	£290,000	£370,000
Unit cost	£2.42	£2.31

Improving capacity utilisation

A business will make better use of its resources if it increases its capacity utilisation. Its unit costs will be lower and profits will be higher. How can firms increase capacity utilisation?

Reduced capacity A business might decide to cut capacity. It might do this by RATIONALISING, for example. This involves reducing excess capacity by getting rid of resources that the business can do without. There is a number of measures a business might take.

- Reducing staff by making people redundant, employing more part-time and temporary staff and offering early retirement.
- Selling off unused fixed assets such as machinery, vehicles, office space, warehouses and factory space.
- Leasing capacity. Debenhams has leased unused floor space in its stores to other retailers, for example. Parts of a factory could also be leased to another manufacturer. The advantage of this is that the space may be reclaimed if demand picks up again.
- Moving to smaller premises where costs are lower.
- MOTHBALLING some resources. This means that fixed assets, such as machinery, are left unused but are

Question 1.

Oliver Handy make mattresses. It is an established business and operates from a small factory in Swindon. It employs twelve staff and has recently appointed a new production manager. In 2006, the then manager retired after 25 years of service to the company. He was replaced by the current manager. Within two months of the new manager arriving some sweeping changes were made to production methods and working practices. The new manager emphasised the importance of production targets, unit costs, staff rewards and operations management. Table 2 shows some financial information for Oliver Handy.

Table 2: Financial information for Oliver Handy

	(£)			
	2004	2005	2006	2007
Total output	12,000	13,500	14,000	17,000
Total cost	252,000	297,000	305,200	297,500

- What is meant by operations management?
- Calculate the unit costs for the four years.
 - What impact has the new production manager had on unit costs?
- How can setting operational targets help a business like Oliver Handy?

maintained, so that they can be brought back into use if necessary.

Increased sales If a business sells more of its output, it will have to produce more. Therefore capacity utilisation will rise. A business might need to spend money on promotion to increase sales, for example. If these costs are not covered by the extra revenue generated, raising capacity utilisation in this way may not be viable.

Increased usage A problem that many businesses face is dealing with peak demand. Train operators can find that capacity utilisation is close to 100 per cent during the 'rush hour', but perhaps as low as 10 per cent late at night. Such businesses would like to increase capacity utilisation during 'off-peak' hours. This might explain why discounts are offered for 'off-peak' travel.

Subcontracting Capacity utilisation can vary considerably within a business. Where capital equipment has low utilisation rates, it might be more efficient for the business to SUBCONTRACT or OUTSOURCE the work. This means hiring or contracting another business to do work which was previously done in-house.

For instance, a business might run a small fleet of delivery vans which on average are on the road for four hours per day. It

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is likely that it would be cheaper for the business to sell the vans and employ a company to make the deliveries. The delivery company would be more efficient because it would be running its vans for much longer during the day. There may also be cost savings in terms of staff. If the business employed full-time drivers for the vans, they would have been under-utilised if they only worked four hours per day.

Subcontracting can also lead to other cost advantages. The delivery business will be a specialist business. It should operate its delivery service more efficiently than a business with a few vans and little knowledge of the industry. If nothing else, it should have greater buying power. It might be able, for instance, to negotiate lower prices for its vans because it is buying more vans. If it is a very small business, its hourly wages may be less than, say, a union-negotiated rate at the larger business.

An alternative outsourcing strategy is to take on outsourcing contracts for other businesses. For example, a major manufacturer of soap could accept contracts from rival soap manufacturers to improve its capacity utilisation. Outsourcing then becomes a strategy for increasing demand for the business.

Redeployment If a business has too many resources in one

part, it may be possible to deploy them in another part. For example, a bank may ask some of its employees to work in another branch for a short period.

Advantages and disadvantages of working at full capacity

Advantages Working at full capacity has some benefits.

- Average costs will be minimised because fixed costs will be spread across as many units of output as possible. This will help to raise profits.
- Staff motivation might be good if workers feel secure in their jobs.
- A busy operation can improve the company's image. As a result, customers might be more confident when placing orders.

Problems However, there may be some drawbacks when a firm is unable to increase output any more.

- The pressure of working at full capacity all the time might put a strain on some of the resources. For example, workers might be doing too much overtime, resulting in tiredness and stress. This might cause accidents or absence.

Question 2.

Zaman & Nazran is a business which specialises in the manufacture of diecast zinc and aluminium products. It produces components for a variety of industries. Since being founded in the mid-1990s, it has grown to today's workforce of 14 employees. Sales were up 7 per cent last year and 50 per cent up from five years ago. It is confident that in the next five years, it can increase its sales by another 50 per cent.

Table 3 shows the number of hours that machinery and equipment were used during each week between July and August 2008. Management works on the assumption that 60 hours per week represents full capacity for the business. This reflects the maximum number of hours that the existing labour force would be prepared to work, including overtime.

Currently, equipment in a typical week is used to 75 per cent capacity. Working to 100 per cent capacity in any week, such as in the second week of July 2008, is unusual and difficult to maintain because machines break down or employees are off work sick. In fact, in the second week of July, the business was forced to sub-contract some of the work to rival companies because it couldn't cope with delivery deadlines set by customers. Seasonal factors affect demand. Orders often fall in late July and early August because customers tend to produce less due to their workers taking summer holidays.

Management has considered rationalisation to reduce costs. Equally the business is committed to an investment programme to buy the latest equipment, which will increase productive efficiency and allow for expansion of sales in the future.

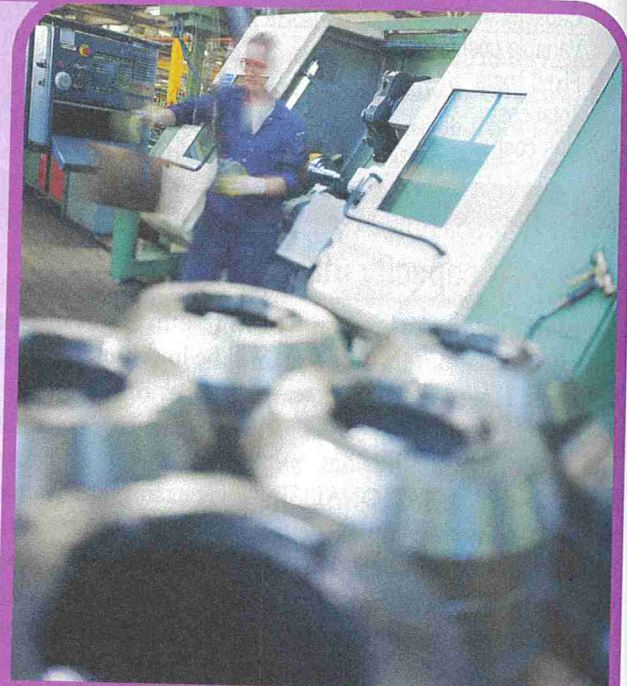


Table 3

	July				August			
Week	1	2	3	4	1	2	3	4
Hours worked	44	60	47	31	41	45	45	47
Capacity utilisation (%)	73	100	?	?	?	?	?	?

- Explain what is meant by:
 - 'capacity utilisation';
 - 'rationalisation'.
- Calculate capacity utilisation for weeks 3–4 in July and weeks 1–4 in August.
- Analyse two ways in which the business could increase capacity utilisation.
- Discuss whether the business would perform better in the long term if it sold off half its plant and equipment, moved to smaller premises, sacked half the workforce and used subcontractors to complete work which it could not manufacture to meet delivery deadlines from customers.

Machines may also be overworked to breaking point.

- The business might lose lucrative orders from new customers.
- There may be insufficient time for staff training and important maintenance work.

Matching production to demand

A production manager has to make sure that production levels are in line with the level of demand. If production levels exceed demand there will be a build up of stocks. This may be expensive because stock holding costs can be very high indeed. Also, if the stocks are not being sold, there will be a drain on resources. However, if production levels are too low, the business may not be able to satisfy demand. This could lead to a loss of trade if customers are kept waiting and decide to buy from a rival. Matching production with demand often means that operational methods should have some flexibility built in. This can be achieved in a number of ways.

Offering overtime Production managers could ask staff to work overtime if orders increase. Overtime is often popular with workers because overtime rates are usually higher than basic wage rates. They may be time and half or double time. However, not all workers will want to work overtime because they have other commitments.

Hiring part-time or temporary staff A business might use temporary or part-time staff to deal with surges in demand. Temporary staff can be 'hired and fired' according to demand levels. They will be employed on very short-term contracts. However, temporary staff will have to be trained and may not be as reliable as permanent staff. Part-time staff are generally more flexible than full-time staff. They can often adapt to changes in the hours they work.

Making flexible use of capital Fluctuations in demand may also mean that capital needs to be flexible. This might be achieved by leasing machinery and equipment in the short-term. For example, vehicles, tools and machinery can be leased to cope with increases in demand.

Using suppliers Businesses will need flexible suppliers. When orders increase a business might need to call on suppliers to make emergency deliveries. Suppliers that cannot offer flexibility and reliability might be avoided.

Adjusting production Production levels can also be adjusted to match demand through rationalisation and subcontracting. This is discussed above.

Holding finished stocks A common way of matching production and demand is to hold stocks of finished goods. If

demand increases, orders can be satisfied from stocks. If demand falls, then stocks can be accumulated. However, stock holding costs need to be taken into account when using this approach.

Some businesses have to cope with **seasonal demand**. These could be businesses operating farms, hotels and other leisure activities, for example. They have to organise their operations to deal with 'peak' demand in the high season and very low demand out of season. The methods discussed above are likely to be even more important to such businesses.

Non-standard orders

It is not unusual for businesses to receive **non-standard orders**. These are orders for goods that the business does not normally produce. For example, a publisher may be asked for a particular book to be available in the Welsh language. To meet such an order businesses may need to reset machines, use different labour skills, different raw materials and possibly different tools. In the example above the publisher would need to employ someone to translate the text, typeset the whole book again and organise a small production run. To meet non-standard orders extra costs will be incurred and a business may charge a premium price. Non-standard orders might be irritating but refusing such orders might lead to a loss of custom. However, accepting non-standard orders might gain new long-term customers.

KEY TERMS

Capacity utilisation – the use that a business makes of its resources.

Excess or surplus capacity – when a business has too many resources, such as labour and capital, to produce its desired level of output.

Mothballing – when machines, equipment or building space are left unused but maintained so they could be brought back into use if necessary.

Operations management – the organisation and control of the process by which inputs, such as labour, materials and machinery, are transformed into final products or by which services are provided to customers.

Operational targets – the goals set by a business that must be achieved in the production of a product or provision of a service.

Rationalising – reducing the number of resources, particularly labour and capital, put into the production process, usually undertaken because a business has excess capacity.

Subcontracting or outsourcing – hiring or contracting another business to do work which could be done in-house by a business.