

OCR A Level Business: Operations 1

Knowledge Organiser: Operations Management

External influences on operational objectives

Economic environment	Crucial for operations. Sudden or short-term changes in demand impact on capacity utilisation, productivity etc. Changes in interest rates impact on the cost of financing capital investment in operations
Competitor efficiency	Quicker, more efficient or better quality competitors will place pressure on operations to deliver at least comparable performance
Technological change	Also very significant – especially in markets where product life cycles are short, innovation is rife and production processes are costly.
Legal & environmental change	Greater regulation and legislation of the environment places new challenges for operations objectives.

Internal influences on operational objectives

Corporate objectives	As with all the functional areas, corporate objectives are the most important internal influence. An operations objective (e.g. higher production capacity) should not conflict with a corporate objective (e.g. lowest unit costs)
Finance	Operations decisions often involve significant investment and cost. The financial position of the business (profitability, cash flow, liquidity) directly affects the choices available
Human resources	For a services business in particular, the quality and capacity of the workforce is a key factor in affecting operational objectives. Targets for productivity, for example, will be affected by the investment in training and the effectiveness of workforce planning
Marketing issues	The nature of the product determines the operational set-up. Regular changes to the marketing mix – particularly product – may place strains on operations, particularly if production is relatively inflexible

Key Types of Operational Objectives



Methods of Production

Job	Batch	Flow
Definition: ① One-off, specialised production. ② Tailor made, meets specific customer requirements. ③ Usually 'labour intensive' (relies heavily on skilled workers).	Definition: ① Made in batches (different shapes, colours, sizes, etc). OR ② Made in stages (doors, bonnets, and engines) and then assembled.	Definition: ① Continuous production. ② Usually mass production & 'capital intensive' (relies heavily on machines).
Advantages: ① Can sell the product for a premium price. ② Worker satisfaction is high, therefore less problems with motivation, absenteeism & labour turnover. ③ The goods have already been ordered (and possibly paid for), so they have already been sold (improving cash flow).	Advantages: ① Workers can be put where they have the best skills e.g. best at making doors or bonnets. ② Production levels of different products can be altered to meet demand.	Advantages: ① Productivity is high and therefore, unit costs are low. ② Workers can be paid low wages because they are unskilled.
Disadvantages: ① Requires highly skilled workers which can be expensive (high wages and high training costs). ② Specialist equipment might be needed for one job, but not the next. ③ Production is slow, so customers need to be willing to wait longer.	Disadvantages: ① Lots of storage space needed for various parts. ② There will be 'downtime' whilst the machines are being changed from making one product to another.	Disadvantages: ① Boredom for workers can lead to mistakes, absenteeism, high labour turnover, and general demotivation. ② High cost of machinery in the short term.

Cell Production

- Flow production line split into a number of **self-contained units**.
- Each **team** or 'cell' is responsible for a significant part of the finished article
- Rather than each person only carrying out only one very specific task, team members are skilled at a number of roles, so it provides a means for **job rotation**.

Cell Production

- http://www.youtube.com/watch?v=54_L8N0
- Team working should improve communication
 - Workers become multi-skilled
 - Greater motivation from varying work
 - Quality improvements
 - Allocation of work to cells has to be efficient.
 - May not allow a firm to use its machinery as intensively as in flow production.

Productivity: Considers the relationship between inputs and outputs. The more a business gets out from its inputs the more productive it is and the lower unit costs.

Productivity Formulas:

Output
Input

** Output could be sales, number produced
** Input could be number of employees, machines, value of machines, wage bill

Importance:

- Lower unit costs, may need less staff
- Competitive advantage if can meet demand quicker
- Can be a performance measure

Ways to increase productivity:

- Train staff (consider the benefits v costs)
- Raise levels of motivation and morale – how?
- Change the system of production method
- ensure lean production (ergonomics)
- Improve technology (costs v benefits)

Economies of Scale: A reduction in unit costs achieved as the scale of production increases

Internal Economies of Scale in the Long Run

- Technical economies** (i.e. benefits of containerisation)
 - Buying economies e.g. bulk buy purchases
 - Risk-bearing economies from diversification
 - Network economies – build networks of suppliers / customers
- Financial economies** e.g. lower interest rates on loans
 - University Research Departments helping to fund research
 - Transport Networks lower logistics costs
 - Relocation of Suppliers to the centre of production
- Agglomeration economies** are important. Businesses in similar industries cluster together and attract an influx of skilled labour which then provides **human capital** to expanding businesses.
 - Highly skilled workers

Diseconomies of scale are an increase in unit costs as a result of increased scale of production

- Communication
- Managing production process – breakdowns from increased use, additional fixed costs
- Poor morale
- Increased overtime

Types of innovation	Invention Formulation of new ideas for products or processes	Innovation Practical application of new inventions into marketable products or services
Product innovation	– Launching new or improved products (or services) on to the market	
Process innovation	– Finding better or more efficient ways of producing existing products, or delivering existing services	

Product innovation - advantages	Process innovation - advantages
<ul style="list-style-type: none"> 'First mover advantage' – which can include some of the following: Higher prices and profitability Added value Opportunity to build early customer loyalty Enhanced reputation as an innovative company Public Relations – e.g. news coverage Increased market share 	<ul style="list-style-type: none"> Reduced costs Improved quality More responsive customer service Greater flexibility Higher profits

Research and Development is a process that enables the creation of new or improved products to meet the needs of customers.

Importance especially in highly competitive and technological markets

Importance grown due to globalisation

Research and Development is needed for:

- Launching new products successfully
- Improving production process
- Considering new materials
- Reducing waste in production process

OCR ALevel Business: Operations 2



Recap. Capacity is the maximum amount of output achievable if all resources are fully utilised.

Capacity utilisation is a measure of the percentage of potential output being achieved.

- Capacity affects the ability of a firm to match supply to demand
- Capacity utilisation affects whether resources are being used efficiently or whether they are lying idle
 - Low capacity utilisation will mean that resources are not being made to work effectively for the business, this will result in high unit costs
 - High capacity utilisation will mean the firm is "sweating" its assets i.e. they are being made to work hard for the business
 - This will result in lower unit costs
 - But may affect quality and cause stress to the resources e.g. workers being pushed to work hard or no maintenance time for machinery

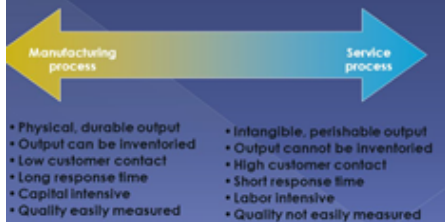
Capacity Utilisation Formula:
$$\frac{\text{Actual level of output}}{\text{Maximum possible output}} \times 100$$

BENEFITS OF FULL CAPACITY	COSTS
Reduces unit costs- more competitive	Time for maintenance lost
Fixed costs spread over more goods	Can't meet more orders in short term
Less wastage of resources	Pressure on employees
Employees busy	Quality level affected

Is there an ideal level of capacity utilisation? The answer is - it depends!
There are several reasons why businesses operate at less than 100% capacity utilisation:

- Lower demand:**
- General reduction in overall market demand
 - Loss of market share
 - Seasonal variation in demand
- Increase in capacity not yet matched by increased demand:**
- Possibly new technology introduced
 - Provide some "slack"
- Inefficiency (a problem = less competitive unit costs)**
- Poor maintenance, quality, employee disruption

Service Vs Manufacturing Processes



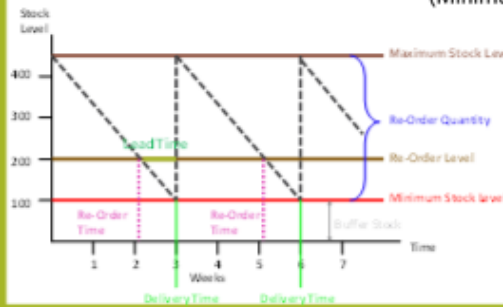
Measuring quality of service provision:

- secret shopper C
- Customer satisfaction level and Customer Complaints
- Customer loyalty- repeat purchase or renewals

Customer Service is Important

- Part of the package of benefits that a customer buys - i.e. part of marketing mix
- Provides a way to differentiate a product
- Helps keep customers & win new ones
- Makes customers feel valued
- Important source of customer feedback
- It helps attract and retain good quality employees

Effective Stock Control Average Stock Level = (Minimum Level + Maximum Level)/2



Stock

Having stocks enables: -

- Goods to be available for production
- Delivery to customers
- Shows the goods available for production
- Enables customer demands to be met
- Allows discounts to be given for bulk buying

Factors Influencing Stock Levels

- The level of demand
- Unpredictability of demand
- Degree of spoilage/ perishability
- Rental costs for storage
- Bulk-buying discounts
- Reliability of suppliers
- Competition - luxury/necessity
- JIT

Holding Stock Benefits	Holding Stock Drawbacks
Satisfying Demand	Storage costs
Coping with fluctuations in demand	Opportunity Costs
Buffer stock to meet late deliveries	Depreciation/Obsolete stock
Cost savings due to purchasing economies of scale	Security Cost
	Insurance costs

OCR ALevel Business: Operations 3



Quality: "A product or service that is able to fulfil its intended purpose, within any legal requirements, to meet the expectations of customers."

- fit for purpose,
- meets laws on design and safety
- meets customer expectations

External Quality Standards:

- BS 5750 Kitemark
- ISO 9000, European Standards

Wastage Rates:

$$\frac{\text{Number of rejects}}{\text{Total number produced}} \times 100$$



Quality Assurance

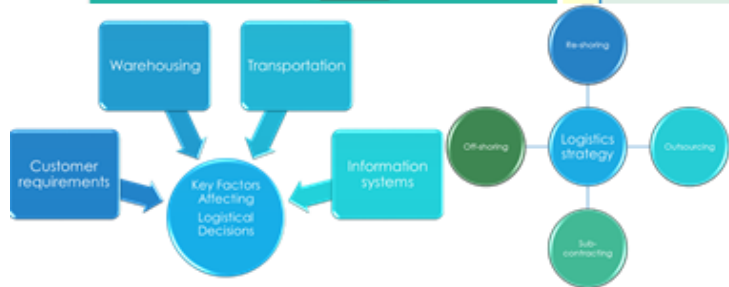
Quality assurance is a proactive method of managing quality as it tries to prevent problems from happening in the first place

Advantages	Disadvantages
<ul style="list-style-type: none"> ▀ Less wastage ▀ Cost effective ▀ Workers feel valued because of responsibility ▀ Improved reputation for good quality 	<ul style="list-style-type: none"> ▀ Slowdown production ▀ Training needed- cost and time ▀ Worker may not like extra responsibility

Quality Control

Quality control is a reactive method of managing quality as it focuses on detecting problems after production is complete, but prior to delivery to customers

Advantages	Disadvantages
<ul style="list-style-type: none"> ▀ Stops faulty goods going out to the customer ▀ Does not disrupt production ▀ Improved reputation 	<ul style="list-style-type: none"> ▀ Wasted resources making faulty products ▀ Cost of inspectors ▀ Does not encourage all workers to be responsible for quality



Logistics: Part of the supply chain management that deals with the procurement of supplies, production, warehousing and transportation.

Supply Chain Management: Strategic coordination of business functions within a firm and with other businesses in the supply chain

External Factors Affecting Operations Management

- P** POLITICAL
- E** ECONOMIC
- S** SOCIAL
- T** TECHNOLOGICAL
- L** LEGAL
- E** ETHICAL / ENVIRONMENTAL

OCR ALevel Business: Operations 4

PERT

(Program evaluation and review technique) Similar to critical path but is more pessimistic in the time taken to complete tasks.

Need to estimate the shortest (optimistic) time and longest (pessimistic) time to complete a given task.

Estimated duration of the project =

$$\frac{\text{Optimistic time} + (4 \times \text{most likely time}) + \text{pessimistic time}}{6}$$

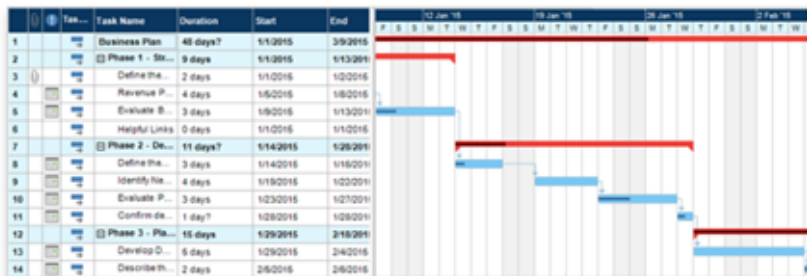
By applying the formula it is more likely to gain a realistic time for a given project.

Work this bit out first

A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time. On the left of the chart is a list of the activities and along the top is a suitable time scale. Each activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity. This allows you to see at a glance:

- What the various activities are
- When each activity begins and ends
- How long each activity is scheduled to last
- Where activities overlap with other activities, and by how much
- The start and end date of the whole project

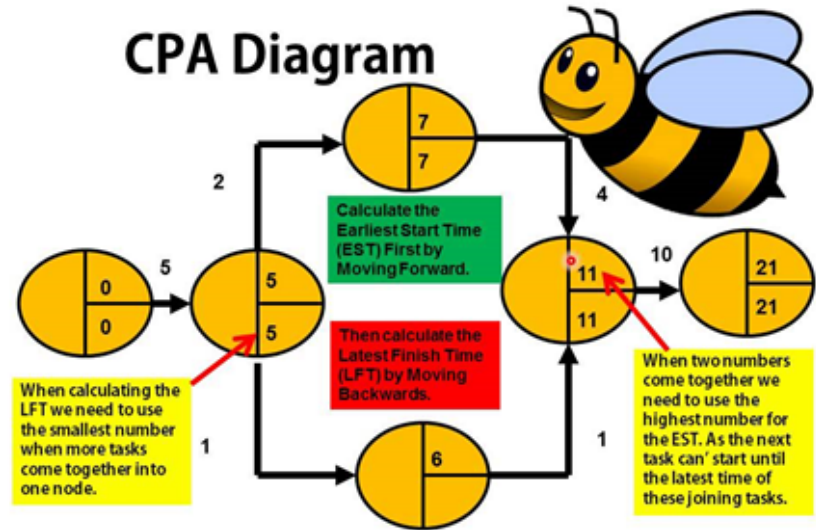
To summarize, a Gantt chart shows you what has to be done (the activities) and when (the schedule).



Project Management a process which involves the planning and organising activities using resources to help achieve the business objectives

- planning
- Executing
- Monitoring
- completing

CPA Diagram



Critical Path Analysis (Network Analysis)

Shows the overall time of a project and considers when activities should start and finish and activities that can run alongside each other

- SIMPLE AND VISUAL FORM OF COMMUNICATION TO SHOW TIMINGS.
- SIMPLE METHOD TO CALCULATE SHORTEST TIME TO COMPLETE THE PROJECT.
- KNOWING EST ALLOWS FOR SUPPLIES TO BE JIT.
- ALLOWS MANAGEMENT TO SEE CONSEQUENCES OF POTENTIAL DELAYS.
- HELPS A BUSINESS SEE WHEN FINANCE WILL BE NEEDED TO ENSURE SUPPLIES WILL BE READY.

- VALUE OF CPA DEPENDS ON ACCURACY OF ACTIVITY TIMES.
- KNOWING SOME ACTIVITIES ARE CRITICAL MAY IMPACT ON QUALITY.
- ONLY CONSIDERS TIMINGS OF ACTIVITIES NOT COST IMPLICATIONS.
- DOES NOT CONSIDER CHANGING EXTERNAL FACTORS.