Exercise walk-through

5.1
Operations and break-even: supported rehearsal

International Baccalaureate · IB Diploma · Business Management · HL

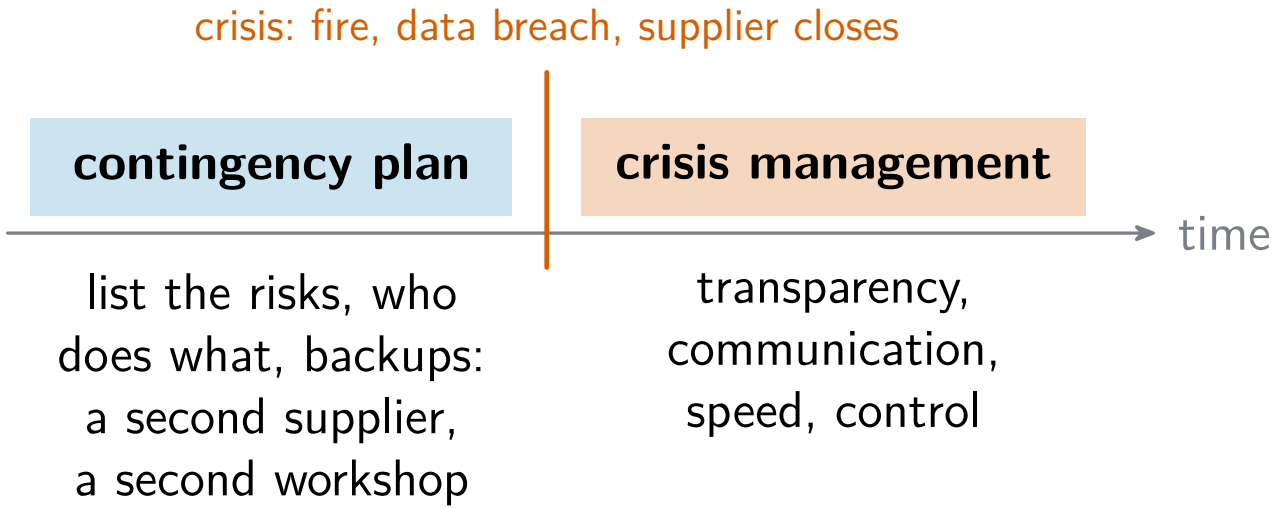
Operations management

- explain the role of operations and **value added**, and compare job, batch, **mass production** and **mass customisation**;
- analyse the factors that decide where a business locates, including outsourcing and reshoring;
- calculate contribution, break-even output, the margin of safety, target output and target price;
- at HL, explain lean production and quality management, plan stock and capacity, and evaluate crisis management, R&D and information systems.

The role of operations and operations methods

- **Operations management** is the part of a business that makes its goods or provides its services.
- It turns **inputs** (labour, materials, machines, money and information) into **outputs** that are worth more than the **inputs**.
- The extra value is **value added** .
- *Inputs are transformed into **outputs** worth more than the inputs: **value added***

Figure: Crisis management, R&D and information systems (HL)



- Plan before; manage during.
- Match each part of the diagram to the text.

Exercises 2.1·2.2

2.1 The firm completes 2 000 repairs a month with 80 employees. Calculate labour productivity and state one way to raise it. [2]

repairs: 2000 a month

employees: 80

2.2 Price per repair is 25, variable cost 15 and monthly fixed costs 12 500. Calculate the contribution per repair and the monthly break-even quantity. [3]

price: 25

variable cost: 15

fixed costs: 12 500 a month

Exercises 2.1·2.2

2.1 The firm completes 2 000 repairs a month with 80 employees. Calculate labour productivity and state one way to raise it. [2]

repairs: 2000 a month

employees: 80

2.1 Labour productivity $= 2\,000/80 = 25$ repairs per employee per month (1). Any one: training to raise skill; better tools or layout; automation of booking; or producing the same output with fewer staff (1).

2.2 Price per repair is 25, variable cost 15 and monthly fixed costs 12 500. Calculate the contribution per repair and the monthly break-even quantity. [3]

price: 25

variable cost: 15

fixed costs: 12 500 a month

2.2 Contribution $= 25 - 15 = 10$ per repair (1). Break-even $= 12\,500/10 = 1\,250$ repairs a month (2).

Exercises 2.3·2.4

2.3 The firm currently completes 2 000 repairs a month. Calculate the margin of safety, in repairs and as a percentage of sales. [2]

actual output: 2000 repairs

2.4 The owner targets a monthly profit of 15 000. Calculate the required output. [3]

target profit: 15 000

Exercises 2.3·2.4

2.3 The firm currently completes 2 000 repairs a month. Calculate the margin of safety, in repairs and as a percentage of sales. [2]

actual output: 2000 repairs

2.3 Margin of safety $= 2\,000 - 1\,250 = 750$ repairs (1), which is $750/2\,000 \times 100 = 37.5\%$ of sales (1).

2.4 The owner targets a monthly profit of 15 000. Calculate the required output. [3]

target profit: 15 000

2.4 Target output $= (12\,500 + 15\,000)/10 = 27\,500/10 = 2\,750$ repairs a month (3 – 2 if the formula is right with a slip).

Exercise 2.5

2.5 The workshops can service 2 500 repairs a month. Calculate capacity utilisation and state one problem of OVER-utilisation. [2]

capacity: 2500 repairs

output: 2000 repairs

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capacity: 2500 repairs
output: 2000 repairs

2.5 Capacity utilisation $= 2\,000/2\,500 \times 100 = 80\%$ (1). Any one over-utilisation problem: no slack for maintenance or breakdowns; overtime and rush costs; quality falls under pressure; staff burnout (1).

Exercise 3.1

3.1 *(Original, Paper 1 style.)* The firm will add a subscription fleet: standard bikes serviced identically, but each subscriber chooses their own accessories and service intervals. Compare job, batch and flow production and recommend, with two reasons, the best method or combination. [6]



Exercise 3.1

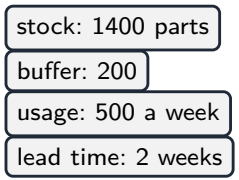
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3.1 Job: one-off custom work – perfect fit to choice, but the highest unit cost and slowest, wrong for a standard fleet (2). Batch: groups of identical services then switch – some flexibility with moderate cost, but changeover time and idle capacity between batches (2). Flow: continuous standardised servicing – lowest unit cost and speed, but inflexible; MASS CUSTOMISATION combines flow efficiency with choice at the accessories stage, which is exactly the subscription model (2). A recommendation committing to mass customisation (or flow with a job-type custom desk) earns the reasoning marks.

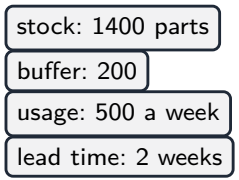
Exercise 3.2

3.2 *(Original, HL lean.)* The firm holds 1 400 parts, of which 200 are buffer stock; usage is 500 parts a week and lead time is two weeks. Explain just-in-time inventory management and evaluate ONE risk of adopting it here. [4]



Exercise 3.2

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3.2 JIT orders parts to arrive exactly when needed, so stock holding and its costs (storage, obsolescence, capital tied up – here roughly 1 400 parts could fall toward the 1 000 reorder level and below) approach zero, and quality faults surface immediately (2). Risk: with no buffer, ONE late or failed delivery stops servicing – the firm's single supplier and two-week lead time make the exposure severe; a stockout costs contributions of 10 per repair and, worse, subscribers' goodwill (2). Mitigation before adopting: dual sourcing or a small buffer – pure JIT does not fit a single-supplier, long-lead-time position.

Exercise 3.3

3.3 *(Original, HL crisis.)* The single parts supplier is hit by a fire. Distinguish crisis management from contingency planning, and outline one contingency plan the firm should have had. [4]



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3.3 Crisis management reacts DURING the event – respond, contain, recover, learn; contingency planning is written BEFORE, identifying risks and rehearsing responses (2). Plan: pre-qualify a SECOND parts supplier with agreed prices and a switched-on order route; hold the 200-part buffer explicitly for supplier failure; assign who decides and communicates in the first hour (2).

Local review guidance: formula, substitution, answer – the examiner marks the method even with arithmetic slips; each method's cost AND flexibility judged before the recommendation; (R1 3.2) the risk evaluated against THIS firm's single-supplier facts, not generic. This is authored classroom guidance.