

Instructor's Manual

Management and Cost Accounting

Seventh edition

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Preface

This manual is intended to assist lecturers' discussion of assignments and lecture topics. 'Points to stress and teaching tips' are provided for each chapter to give broad guidance on relevant issues or potential areas of difficulty to students. Solutions are offered for end-of-chapter 'assessment material' in the text. Case notes prepared (in most cases) by the case writer to all cases included in the text are also provided.

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PART I

MANAGEMENT AND COST ACCOUNTING FUNDAMENTALS

The manager and management accounting

Teaching tips and points to stress

Modern management accounting

While the accounting system provides information (e.g. product costs and downtime) for management decisions, cost management refers to active use of this information to plan and control costs. Cost management requires managers to actively seek ways to reduce costs. Much cost management occurs well before the accounting system recognises costs. (The product design stage often offers more cost management opportunities than controlling manufacturing operations.) Cost management is integrated throughout the text.

To reinforce the value-chain concept, ask a student to illustrate activities/costs in each function in the context of his/her work experience.

Students are often confused about the difference between R&D and Design. The distinctions are not always clear-cut but R&D is basic research and idea generation, whereas design turns those ideas into reality. Design encompasses development of prototype products and the manufacturing process by which the products are produced.

Elements of management control

Planning and control are distinct activities but they go hand in hand. To maximise the benefits from planning (e.g. budgeting), the manager should use that plan as a benchmark for controlling (i.e. assessing the effectiveness and efficiency of implementation). Conversely, it is difficult to control activities without a plan or budget.

To help students understand how accounting numbers can affect employees' behaviour and hence firm's performance, ask questions, such as if a materials procurement officer's annual bonus depends on the difference between budgeted price and actual price paid, how will the officer behave? The officer may be tempted to purchase cheap, perhaps low-quality materials that may not be delivered on a reliable, timely basis; he or she may refuse to order materials for rush orders if there will be an extra delivery charge, etc.

Although it is difficult to quantify the costs and benefits of accounting systems, a decision about the system will be made. The question is whether costs and benefits are considered implicitly (as part of a 'gut feeling') or explicitly, where effects of different estimates can be examined. Additionally, it is always essential to consider the context in which management operates.

Product cost information permeates all three functions. In the scorekeeping function, accountants accumulate product cost information for both external and internal reporting. Product cost information can help identify cost management opportunities (i.e. attention directing) and it is used in make-or-buy decisions, where managers compare the cost of making the product or component with the cost of buying it from an external supplier (i.e. problem solving).

Costs, benefits and context

The 'best' information system depends on both technical and human aspects of the specific situation. This is a major difference between financial accounting, where firms generally need to comply with external reporting requirements where they exist, and management accounting, where choices are based on an explicit or implicit cost-benefit analysis. Management accounting students must do more than memorising rules. They must evaluate the situation and context, decide which technique or information system is most appropriate and implement it.

A key challenge in management accounting

One major challenge faced by accountants relates to digitalisation. This is the process by which firms become digital businesses and the use of digital technologies changes the business model and provides new revenue and value-producing possibilities. Digitalisation is about enterprises not just having to become digitised but *being* digital.

Some emerging technologies which management accountants should understand are: *artificial intelligence (AI) and robotics, blockchain, big data and analytics, and the cloud.*

Solutions to review questions

1.1 The five broad purposes are:

Purpose 1: Formulating overall strategies and long-range plans.

Purpose 2: Resource allocation decisions such as product and customer emphasis and pricing.

Purpose 3: Cost planning and cost control of operations and activities.

Purpose 4: Performance measurement and evaluation of people.

Purpose 5: Meeting external regulatory and legal reporting requirements where they exist.

1.2 **Management accounting** measures and reports financial as well as other types of information that may be useful to managers in fulfilling the goals of the organisation.

Financial accounting focuses on external reporting that is guided by generally accepted accounting principles.

1.3 The business functions in the value chain are:

- Research and development – the generation of, and experimentation with, ideas related to new products, services or processes.
- Design of products, services and processes – the detailed planning and engineering of products, services or processes.
- Production – the coordination and assembly of resources to produce a product or deliver a service.

- Marketing – the process by which individuals or groups (a) learn about and value the attributes of products or services and (b) purchase those products or services.
- Distribution – the mechanism by which products or services are delivered to a customer.
- Customer service – the support activities provided to the customers.

1.4 **Cost management** refers to actions that managers undertake to satisfy customers while continuously reducing and controlling costs.

1.5 A successful accountant requires general business skills (such as understanding the strategy of an organisation) and people skills (such as motivating other team members) as well as technical skills (such as computer knowledge).

1.6 Yes. Drucker is advocating that accountants do more than scorekeeping, which is often interpreted as being a 'bobby on the beat' or a 'watchdog'. It is also essential that accountants emphasise their attention-directing and problem-solving functions.

1.7 The new accountant could reply in one or more of several ways:

- a.** Demonstrate to the plant manager how he or she could make better decisions, if the plant accountant was viewed as a resource rather than a dead weight.

In a related way, the plant accountant could show how the plant manager's time and resources could be saved by viewing the new plant accountant as a team member.

- b.** Demonstrate to the plant manager a good knowledge of technical aspects at the plant. This approach may involve doing background reading. It certainly will involve spending much time on the plant floor speaking to plant personnel.

- c.** Show the plant manager's examples of the new plant accountant's past successes in working with line managers in other plants. Examples could include

- assistance in preparing the budget,
- assistance in analysing problem situations and
- assistance in submitting capital budget requests.

- d.** Seek assistance from the corporate accountant to highlight to the plant manager the importance of many tasks undertaken by the new plant accountant. This approach is a last resort but may be necessary in some cases.

1.8 A customer-driven management accountant function would

- a.** approach its customers (such as managers in different parts of the value chain) to determine how it can facilitate those managers in making better decisions and
- b.** solicit regular and systematic feedback from those customers about its performance.

- 1.9** Yes, management accountants have customers just as companies have customers who purchase their products or services. Management accountants provide information and advice to many line and staff people in the organisation and to various external parties. It is essential that they provide information and advice that line and staff customers and external parties view as timely and relevant.
- 1.10** Five themes that affect the way managers operate and have prompted developments in management accounting are the following:
- Customer satisfaction is priority one
 - Key success factors (cost, quality, time and innovative products, and services)
 - Total value-chain analysis
 - Continuous improvement
 - Dual external/internal focus.

Solutions to exercises

- 1.13** Value chain and classification of costs, computer company. (15 min)

Cost item	Value-chain business function
a	Production
b	Distribution
c	Design
d	Research and development
e	Customer service
f	Design (or research and development)
g	Marketing
h	Production

- 1.14** Value chain and classification of costs, pharmaceutical company. (15 min)

Cost item	Value-chain business function
a	Design
b	Marketing
c	Customer service
d	Research and development
e	Marketing
f	Production
g	Marketing
h	Distribution

1.15 Uses of feedback. (10 min)

Item	Use of feedback
a	2
b	6
c	4
d	3
e	5
f	1

1.16 Scorekeeping, attention directing and problem solving. (15 min)

Because the accountant's duties are often not sharply defined, some of these answers might be challenged.

Activity	Function
a	Scorekeeping
b	Attention directing
c	Scorekeeping
d	Problem solving
e	Attention directing
f	Attention directing
g	Problem solving
h	Scorekeeping, depending on the extent of the report
i	This question is intentionally vague. The give-and-take of the budgetary process usually encompasses all three functions but it emphasises scorekeeping the least. The main function is attention directing but problem solving is also involved.
j	Problem solving

1.17 Scorekeeping, attention directing and problem solving. (15 min)

The accountant's duties are often not sharply defined, so some of these answers might be challenged.

Activity	Function
a	Attention directing
b	Problem solving
c	Scorekeeping

Activity	Function
d	Scorekeeping
e	Scorekeeping
f	Attention directing
g	Problem solving
h	Scorekeeping
i	Problem solving
j	Attention directing

1.18 Changes in management and changes in management accounting. (15 min)

Change in management accounting	Key theme in newly evolving management approach
a	Total value-chain analysis
b	Key success factors (quality) or total value-chain analysis
c	Dual external/internal focus
d	Continuous improvement
e	Customer satisfaction is priority one

1.19 Planning and control, feedback. (15–20 min)

- 1. Planning** is choosing goals, predicting results under various ways of achieving those goals and then deciding how to attain the desired goals. One of the goals of the European Starting News (ESN) is to increase operating income. Increasing revenues is potentially one way to achieve this if the increase in revenues exceeds any associated increase in costs. ESN expects daily circulation to increase from 250,000 per day in April to 400,000 per day in May. This budgeted circulation gain is expected to increase newspaper revenues from €5,250,000 in April to a budgeted €6,200,000 in May.

Control covers both the actions that implement the planning decision and the performance evaluation of the personnel and operations. At ESN, the price drop would be announced to its sales force and probably to customers. Requirement 2 illustrates a performance report for May 2003.

2.

	Actual results	Budgeted amounts	Variance
Newspapers sold	13,600,000	12,400,000	1,200,000 fav
Price per paper	€0.50	€0.50	€0.00 fav
Newspaper revenue	€6,800,000	€6,200,000	€600,000 fav

3. Based on the €600,000 favourable variance for circulation revenue, Saunier might take the following actions:
 - a. Change predictions. ESN underestimated the daily circulation gain by 40,000 copies per day. It might examine the procedures it uses to estimate the response of circulation to price changes.
 - b. Change operations. ESN might now change its advertising rates to reflect that circulation in May is 76% above that of April. This gives advertisers a much larger audience they can reach with each advertisement in the ESN.

1.20 Professional ethics and reporting divisional performance. (10–15 min)

1. Devallois's ethical responsibilities are well summarised in Ethical Guidelines. Areas of ethical responsibility include
 - competence,
 - confidentiality,
 - integrity and
 - objectivity.

The key area related to Devallois's current dilemma is integrity. Devallois should refuse to book the €200,000 of sales until the goods are shipped. Both financial accounting and management accounting principles maintain that the sales are not complete until the title is transferred to the buyer.

2. Devallois should refuse to follow Clément's orders. If Clément persists, the incident should be reported to the corporate accountant. Support for line management should be wholehearted but it should not require unethical conduct.

1.21 Responsibility for analysis of performance. (20–30 min)

This problem raises plenty of thought-provoking questions. Unfortunately, there are no pat answers. The generalisations about these relationships are difficult to formulate.

1. Apparently, the accountant's performance-analysis staff have not won the confidence or respect of Hedby and other line officers. Hedby regards these accountants as interlopers who are unqualified for their analytical tasks on two counts: (a) the task is Hedby's not the accountants' and (b) Hedby understands his own problems best. It is unlikely that the accountant's performance-analysis staff have maintained a day-to-day relationship with line personnel in Division C.
2. Nedregotten should point out that her performance-analysis staff are doing the work in order to enable Hedby to better concentrate on his other work. The detached analyses by her staff should help Hedby better understand and improve his own performance.

Furthermore, Nedgrotten should point out that Hedby would need his own divisional accounting staff in order to prepare the necessary analysis of performance, if Hedby's group did not support him. More uniform reporting formats and procedures and more objective appraisals could potentially occur if the performance-analysis staff remain as part of the corporate accountant's group.

3. Two approaches within the existing organisation reporting relationships are the following:
 - a. Placing higher priority on having her performance-analysis staff view the division personnel as important customers and actively seeking out ways to increase customer satisfaction.
 - b. Encouraging greater use of teams in which division personnel and corporate control personnel are members. Hopefully, mutual respect will increase by this close interaction.

A more extreme approach would be to change the organisation's reporting relationships and staff assignments. For example, each division manager could have his or her own performance-analysis staff member as part of the plant accountant's group.

1.23 Planning and control decisions: Internet company. (30 min)

1. **Planning decisions** at WebNews.co.uk focus on organisational goals, predicting results under various alternative ways of achieving those goals and then deciding on how to attain the desired goals. For example, WebNews.co.uk could have the objective of revenue growth to gain critical mass or it could have the objective of increasing operating income. Many Internet companies in their formative years make revenue growth (and subscriber growth) their primary goal.

Control focuses on (a) deciding on and taking actions that implement the planning decisions and (b) deciding on performance evaluation and the related feedback that will help future decision making.

2. Planning decisions

- a. Decision to raise monthly subscription fee.
- c. Decision to upgrade content of online services.
- e. Decision to decrease monthly subscription fee.

Control decisions

- b. Decision to inform existing subscribers about the rate of increase – an implementation part of control decisions.
- d. Demotion of VP of Marketing – performance evaluation and feedback aspect of control decisions.

1.24 Problem solving, scorekeeping and attention directing: Internet company.
(30 min)

1. Problem solving – comparative analysis for decision making.

Scorekeeping – accumulating data and reporting reliable results to all levels of management.

Attention directing – helping managers to properly focus their attention.

2. a. and e Decisions to change subscription fee.

Problem solving – report outlining expected revenues from subscribers and advertising with different monthly fee amounts.

Scorekeeping – report with monthly subscribers and their revenues in prior months.

Attention directing – report showing the change in the number of subscribers of Internet companies at the time they change their monthly fees.

b. Decision in June 2005 to inform existing subscribers about rate increase in July.

Problem solving – report showing the cost of different ways of informing subscribers of the rate increase.

Scorekeeping – report showing how many subscribers immediately paid the new subscription fee when past fee increases occurred.

Attention directing – report showing the number of subscribers to the service that have not logged on for two months or more.

c. Decision to upgrade the content of online services.

Problem solving – report showing the expected cost of alternative ways to upgrade content.

Scorekeeping – labour cost tracking of software developers who work on content.

Attention directing – report on cost overruns relative to budget for ongoing content upgrades.

d. Demotion of VP of Marketing

Problem solving – budgeted cost of marketing department with alternative management teams.

Scorekeeping – report showing breakdown of subscribers into renewals and new subscribers.

Attention directing – report highlighting subscriber growth and rates of competing Internet news services.

An introduction to cost terms and purposes

Teaching tips and points to stress

Costs in general

Cost assignment is a general term for attaching either direct or indirect costs to cost objects. The distinction between direct and indirect costs is important because direct costs are directly traced to the cost object, whereas indirect costs are often pooled and then allocated to the cost object with less precision. Management, therefore, has more confidence in the accuracy of direct costs. The text uses the term 'cost tracing' to refer specifically to assigning direct costs to cost objects. Cost allocation is reserved for assigning indirect costs to cost objects.

Cost objects include (1) activities or processes; (2) outputs of processes, such as products, services and projects; (3) parts of the organisation (e.g. departments or programmes) and (4) customers. Information on costs associated with these cost objects facilitates decisions such as (1) which manufacturing process is most economical, (2) what price should be charged for the service, (3) which department uses its resources most efficiently and (4) which customers contribute most to the company's profits. There is more to cost accounting than product costing.

Direct costs and indirect costs

Students have trouble with the distinctions between direct/indirect costs and cost tracing/cost allocation. Familiar examples can help. Public accounting firms directly trace direct professional labour costs to each audit engagement (through time sheets). In contrast, rent on the firm's office and depreciation on its computers cannot be traced to individual engagements. These are indirect costs that must be allocated to the different engagements. Allocation of indirect costs is a difficult but important topic that is covered in more detail in later chapters.

Example: Is photocopying a direct or an indirect cost with respect to department cost objects? In the past, it was difficult to keep track of the amount of copying done by different departments. Moreover, there was generally less copying. Photocopying was typically considered an indirect cost because it was often an immaterial amount and hard to trace. Today, businesses are making more photocopies than ever before. Counters inserted into copiers (copy keys) easily keep track of the number of copies made by each user. Because copying costs are now higher and easier to trace, they are more often directly traced. (An additional benefit of the counters is that they may induce employees to make fewer copies because the number of copies is now more observable.)

Cost drivers and cost management

Cost management occurs when managers actively strive to reduce costs. Two major avenues for cost management are focusing on value-added activities (and eliminating non-value-added activities such as stock handling) and reducing consumption of cost drivers in value-added activities. Reduced consumption of cost drivers reduces costs only if managers actively squeeze costs down. As more managers do their own word processing, typing by secretaries declines. But unless management reduces the number of secretaries in response to the reduced workload, secretarial costs will not reduce.

Two types of cost behaviour pattern: variable costs and fixed costs

The distinction between variable costs (VCs) and fixed costs (FCs) is necessary to address basic questions such as how much manufacturing costs change if the level of output increases by 5%. For example, many fast-food restaurants guarantee workers only an hour or two of work per shift. If sales are less than expected, workers can be dismissed for the shift after their guaranteed hour (or two). In this case, direct-labour cost varies directly with output (sales). In contrast, many government workers are salaried and cannot be dismissed except under extreme circumstances. Here, direct-labour costs for a government department are relatively fixed.

Students are often confused about when VCs are variable and when FCs are fixed. Variable costs vary in total and FCs are fixed in total. However, VCs per unit are consistent and FCs per unit decline as more units are produced.

Total costs and unit costs

Students often treat 'unitised' fixed costs as if they were variable costs, forgetting that fixed costs are fixed in total. They attempt to calculate total costs by multiplying the cost per unit by the number of units. Because of this misleading nature of unitised fixed costs, it is better to base projections and comparisons on total costs. When estimating total costs, students should consider variable costs as an amount per unit and fixed costs as a lump sum total amount.

Financial statements and cost terminology

The basic concepts of assigning costs to cost objects (and using this information for planning and control) apply to service, merchandising and manufacturing companies. Students find it easier to grasp the basic concepts by starting with service companies, which are the simplest as they have no stocks. Merchandisers add the complications of purchases and stocks. The final step is manufacturers, which are more difficult due to the complexities of cost of good manufactured (CGM) and the three types of stock.

Solutions to review questions

2.1 A cost object is anything for which a separate measurement of costs is desired.

Examples include a product, a service, a project, a customer, a brand category, an activity, a department and a programme.

2.2 Costs are not direct or indirect in isolation. A cost object (such as a product, service or project) must be specified.

- Direct costs of a cost object are those costs that are related to the particular cost object and that can be traced to it in an economically feasible (cost-effective) way.
- Indirect costs of a cost object are those costs that are related to the particular cost object but cannot be traced to it in an economically feasible (cost-effective) way.

Assume that the cost object is a Macintosh computer product. Apple assembles multiple products in each of its plants. The computer screen is a direct cost of the Macintosh. In contrast, the salary of the security guard at the plant where the Macintosh is assembled would be an indirect cost of the Macintosh.

- 2.3 Consider a supervisor's salary in a maintenance department of a telephone company. If the cost object is the department, the salary is a direct cost. If the cost object is a telephone call by a customer, the salary is an indirect cost.

- 2.4 Factors affecting the classification of a cost as direct or indirect include

1. the materiality of the cost in question,
2. available information-gathering technology,
3. design of operations and
4. contractual arrangements.

- 2.5 A cost driver is any factor that affects total costs. Examples include:

Business function	Example of cost driver
Research and development	Number of research projects
Design	Number of products in design
Production	Number of units produced
Marketing	Number of advertisements run
Distribution	Number of items distributed
Customer service	Number of service calls

- 2.6 The relevant range is the range of the cost driver in which a specific relationship between cost and driver is valid. This concept enables the use of linear cost functions when examining cost–volume–profit (CVP) relationships as long as the volume levels are within that relevant range.

- 2.7 A unit cost is calculated by dividing some total cost (the numerator) by some number of units (the denominator). In many cases, the numerator will include a fixed cost that will not change despite changes in the number of units to be assembled. It is erroneous in those cases to multiply the unit cost by volume changes to predict changes in total costs at different volume levels.

- 2.8 Descriptions of the three sectors are:

- Service-sector companies provide services or intangible products to their customers – for example, legal advice or an audit. These companies do not have any stock of intangible products at the end of an accounting period.
- Merchandising-sector companies provide tangible products they have previously purchased in the same basic form from suppliers. Merchandise purchased from suppliers but not sold at the end of an accounting period is held as stock.

- Manufacturing-sector companies provide tangible products that have been converted to a different form from the products purchased from suppliers. At the end of an accounting period, stock of a manufacturer can include direct materials, work in progress and finished goods.

Thus, manufacturing and merchandising companies have stock while service companies do not. Manufacturing companies have direct materials, work in progress and finished goods stock, whereas merchandising companies have only goods purchased for resale stock (merchandise stock).

2.9 The three major categories of the stockable costs of a manufactured product are:

1. direct materials costs,
2. direct manufacturing labour costs and
3. indirect manufacturing costs.

2.10 *Direct materials costs* are the acquisition costs of all materials that eventually become part of the cost object (say, units finished or in progress) and that can be traced to that cost object in an economically feasible way. Acquisition costs of direct materials include freight-in (inward delivery) charges, sales taxes and customs duties. *Direct manufacturing labour costs* include the compensation of all manufacturing labour that is specifically identified with the cost object (say, units finished or in progress) and that can be traced to the cost object in an economically feasible way. Examples include wages and fringe benefits paid to machine operators and assembly-line workers.

Indirect manufacturing costs are all manufacturing costs considered to be part of the cost object (say, units finished or in progress) but that cannot be individually traced to that cost object in an economically feasible way. Examples include power supplies, indirect materials, indirect manufacturing labour, plant rent, plant insurance, property taxes on plants, plant depreciation and the compensation of plant managers.

Prime costs are all direct manufacturing costs. In the two-part classification of manufacturing costs, prime costs would comprise direct materials costs. In the three-part classification, prime costs would comprise direct materials costs and direct manufacturing labour costs.

Conversion costs are all manufacturing costs other than direct materials costs.

Solutions to exercises

2.11 Total costs and unit costs. (10 min)

1. Total cost, €40,000. Unit cost per person, $€40,000 \div 500 = €80.00$.
2. Total cost, €40,000. Unit cost per person, $€40,000 \div 2000 = €20.00$.
3. The main lesson of this problem is to alert the student early in the course to the desirability of thinking in terms of total costs rather than unit costs wherever feasible. Changes in the number of cost driver units will affect total variable costs but not total fixed costs. In our example, it would be perilous to use either the

€80.00 or the €20.00 unit cost to predict the total cost because the total costs are not affected by the attendance. Instead, the student association should use the €40,000 total cost. Obviously, if the musical group agreed to work for, say €40.00 per person, such a unit variable cost could be used to predict the total cost.

2.13 Total costs and unit costs. (10 min)

1. Unit cost = Total costs ÷ Number of units.

	Total costs (€)	Number of units	Unit cost (€)
a.	60,000	200	300
b.	60,000	250	240
c.	60,000	300	200

2. The unit-cost figures per passenger calculated in requirement 1 should play no role in predicting the total air-flight costs to be paid next month. Weltferien pays SaxonAir on a per round-trip flight basis but not on a per passenger basis. Hence, the cost driver for next month is the number of round-trip flights and not the number of passengers.

2.14 Classification of costs, service sector. (15–20 min)

Cost object: Each individual focus group.

Cost variability: With respect to changes in the number of focus groups.

There may be some debate over classifications of individual items. Debate is more likely as regards cost variability.

Cost item	D or I	V or F
A	D	V
B	I	F
C	I	V ^a
D	I	F
E	D	V
F	I	F
G	D	V
H	I	V ^b

^a Some students will note that phone call costs are variable when each call has a separate charge. It may be a fixed cost if Presta-Serviços has a flat monthly charge for a line, irrespective of the amount of usage.

^b Petrol costs are likely to vary with the number of focus groups. However, vehicles likely serve multiple purposes and detailed records may be required to examine how costs vary with changes in one of the many purposes served.

2.15 Classification of costs, merchandising sector. (15–20 min)

Cost object: Film section of store.

Cost variability: With respect to changes in the number of films sold, assumptions may be made over classifications of individual items. This is mainly in relation to cost variability. Whether DVDs and videos cost the same is another matter.

Cost item	D or I	V or F
A	I	F
B	I	V
C	D	V
D	D	F
E	I	F
F	I	V
G	I	F
H	D	V

2.16 Cost drivers and the value chain. (15 [AQ1]min)

1.

	Business function area	Representative cost driver
A	Research and development	Number of research scientists
B	Design of products/processes	Hours of CAD work
C	Production	Number of machine assembly hours
D	Marketing	Number of sales personnel
E	Distribution	Weight of cars shipped
F	Customer service	Number of calls recalled for defective parts

2.

Business function area	Representative cost driver
A Research and development	<ul style="list-style-type: none"> Hours of design and testing work Number of new models in development
B Design of products/processes	<ul style="list-style-type: none"> Number of focus groups on alternative models and designs Hours of engineering and retooling
C Production	<ul style="list-style-type: none"> Number of units coming off assembly line Number of models manufactured
D Marketing	<ul style="list-style-type: none"> Number of promotion packages mailed Number of sales
E Distribution	<ul style="list-style-type: none"> Number of cars shipped overseas Number of cars delivered to showrooms
F Customer service	<ul style="list-style-type: none"> Number of cars recalled Number of personnel on free customer phone lines

2.17 Calculating cost of goods manufactured and cost of goods sold. (20–25 min)

Schedule of cost of goods manufactured for the year ended 31 December 2018 (in €million)

	€m	€m
Direct materials used		13.05
Direct manufacturing labour costs		15.10
Indirect manufacturing costs:		
Property tax on plant building	0.45	
Plant utilities	2.56	
Depreciation of plant building	1.35	
Depreciation of plant equipment	1.65	
Plant repairs and maintenance	2.40	
Indirect manufacturing labour costs	3.45	
Indirect materials used	1.65	
Miscellaneous plant overhead	<u>0.60</u>	<u>14.10</u>
Manufacturing costs incurred during 2018		32.25
Add opening work in progress stock, 1 January 2018		<u>3.00</u>
Total manufacturing costs to account for		35.25
Deduct closing work in progress stock, 31 December 2018		<u>3.90</u>
Cost of goods manufactured		<u>31.35</u>

Schedule of cost of goods sold for the year ended 31 December 2018 (in €million)

	€m
Opening finished goods, 1 January 2018	4.05
Cost of goods manufactured (above)	<u>31.35</u>
Cost of goods available for sale	35.40
Closing finished goods, 31 December 2018	<u>5.10</u>
Cost of goods sold	<u>30.30</u>

2.18 Income statement and schedule of cost of goods manufactured. (25–30 min)

Howell Ltd

*Income Statement for the Year Ended 31 December 2018
(in £millions)*

	£m	£m
Revenues		950
Cost of goods sold:		
Opening finished goods, 1 January 2018	70	
Cost of goods manufactured (below)	<u>645</u>	
Cost of goods available for sale	715	
Closing finished goods, 31 December 2018	<u>55</u>	<u>660</u>
Gross margin		290
Marketing, distribution and customer-service costs		<u>240</u>
Operating income		<u>50</u>

Howell Ltd

*Schedule of cost of goods manufactured for the year ended 31 December
2018 (in £millions)*

	£	£
Direct materials costs:		
Opening stock, 1 January 2018	15	
Purchases of direct materials	<u>325</u>	
Cost of direct materials available for use	340	
Closing stock, 31 December 2018		<u>20</u>
Direct materials used		320
Direct manufacturing labour costs		100
Indirect manufacturing costs:		
Indirect manufacturing labour	60	
Plant supplies used	10	
Plant utilities	30	
Depreciation – plant, building and equipment	80	
Plant supervisory salaries	5	
Miscellaneous plant overhead	<u>35</u>	<u>220</u>
Manufacturing costs incurred during 2018		640
Add opening work in progress stock, 1 January 2018		<u>10</u>
Total manufacturing costs to account for		650
Deduct closing work in progress, 31 December 2018		<u>5</u>
Cost of goods manufactured		<u>£645</u>

2.19 Interpretation of statements. (20–25 min)

1. The schedule in 2.18 can become a schedule of cost of goods manufactured and sold simply by including the opening and closing finished goods stock figures in the supporting schedule, rather than directly in the body of the income statement. Note that the term cost of goods manufactured refers to the cost of goods brought to completion (finished) during the accounting period, whether they were started before or during the current accounting period. Some of the manufacturing costs incurred are held back as costs of the closing work in progress; similarly, the costs of the opening work in progress stock become a part of the cost of goods manufactured for the following year.
2. The sales manager's salary would be charged as a marketing cost as incurred by both manufacturing and merchandising companies. It is basically an operating cost that appears below the gross margin line on an income statement. In contrast, an assembler's wages would be assigned to the products worked on. Thus, the wages cost would be charged to work in progress and would not be expensed until the product is transferred from finished goods stock to cost of goods sold as the product is sold.
3. The direct–indirect distinction can be resolved only with respect to a particular cost object. For example, in defence contracting, the cost object may be defined as a contract. Then, a plant supervisor's salary may be charged directly and wholly to that single contract.
4. Direct materials used = $\text{£}320,000,000 \div 1,000,000 \text{ units} = \text{£}320 \text{ per unit}$.
Depreciation = $\text{£}80,000,000 \div 1,000,000 \text{ units} = \text{£}80 \text{ per unit}$.
5. Direct materials unit cost would be unchanged at £320. Depreciation unit cost would be $\text{£}80,000,000 \div 1,200,000 = \text{£}66.67 \text{ per unit}$. Total direct materials costs would rise by 20% to £384,000,000, whereas total depreciation would be unaffected at £80,000,000.
6. Unit costs are averages and they must be interpreted with caution. The £320 direct materials unit cost is valid for predicting total costs because direct materials is a variable cost; total direct materials costs indeed change as output levels change. However, fixed costs like depreciation must be interpreted quite differently from variable costs. A common error in cost analysis is to regard all unit costs as one – as if all the total costs to which they are related are variable costs. Changes in output levels (the denominator) will affect total variable costs but not total fixed costs. Graphs of the two costs may clarify this point; it is safer to think in terms of total costs than in terms of unit costs.

2.20 Finding unknown balances. (20–25 min)

Let G = given, I = inferred.

Step 1: Use gross margin formula	Case 1	Case 2
Revenues	£32,000G	£31,800G
Cost of goods sold	A 20,700I	20,000G
Gross margin	11,300G	C 11,800I
Step 2: Use schedule of cost of goods manufactured formula	Case 1	Case 2
Direct materials used	£8,000G	£2,000G
Direct manufacturing labour costs	3,000G	5,000G
Indirect manufacturing costs	7,000G	D 6,500I
Manufacturing costs incurred	18,000I	23,500I
Add opening work in progress, 1 January	0G	800G
Total manufacturing costs to account for	18,000I	24,300I
Deduct closing work in progress, 31 December	0G	3,000G
Cost of goods manufactured	18,000I	21,300I
Step 3: Use cost of goods sold formula	Case 1	Case 2
Opening finished goods stock, 1 January	£4,000G	£4,000G
Cost of goods manufactured	18,000I	21,300I
Cost of goods available for sale	22,000I	25,300I
Closing finished goods stock, 31 December	B 1,300I	5,300G
Cost of goods sold	20,700I	20,000G

For case 1, do steps 1, 2 and 3 in order.

For case 2, do steps 1, 3 and then 2.

2.21 Fire loss, computing stock costs. (30–40 min)**1. Cost of goods sold (or COGS)**

$$= \text{Revenue} \times (1 - \text{gross margin percentage based on sales})$$

$$= 10(1 - 0.2) = 8$$

$$\Leftrightarrow \text{Cost of goods available for sales} - \text{Closing finished goods stock} = \text{COGS}$$

$$\Leftrightarrow 9 - \text{Closing finished goods stock} = 8$$

$$\Leftrightarrow \text{Finished goods stock (as at 26}^{\text{th}} \text{ Feb)} = 1$$

2. Indirect manufacturing costs = 40% of conversion cost

$$\Rightarrow \text{DL cost} = 60\% \text{ of conversion cost} \Rightarrow \text{conversion cost} = 3.6 / 0.6 = 6$$

$$\Rightarrow \text{Indirect manufacturing costs} = 6 \times 40\% = 2.4$$

Manufacturing costs = DM cost + DL cost + Indirect manufacturing costs

$$= 2.28 + 3.6 + 2.4 = 8.28$$

Cost of goods manufactured = Cost of goods available for sales – Opening finished goods stock = 9 – 0.6 = 8.4

Work-in-progress stock (26 February) = Work-in-progress stock (1st Jan) +

Manufacturing costs – Cost of goods manufactured = 0.68 + 8.28 – 8.4 = 0.56

3. Prime cost = DM cost + DL cost

$$\Leftrightarrow 5.88 = \text{DM cost} + 3.6 \text{ } \therefore \text{DM cost} = 2.28$$

$$\text{DM cost} = \text{DM (1st Jan)} + \text{DM purchased} - \text{DM (26th Feb)}$$

$$\Leftrightarrow 2.28 = 0.32 + 3.2 - \text{DM (26th Feb)}$$

$$\Leftrightarrow \text{DM (26th Feb)} = 1.24$$

2.22 Comprehensive problem on unit costs, product costs. (30 min)

1. If 2 kg of direct materials are used to make each unit of finished product, 100,000 units \times 2 kg or 200,000 kg were used at €10.70 per kg of direct materials (€140,000 \div 200,000 kg). Therefore, the closing stock of direct materials is 2000 kg \times €0.70 = €1,400.

2.

Manufacturing costs for 100,000 units

	Variable	Fixed	Total
Direct materials costs	€140,000	€	€140,000
Direct manufacturing labour costs	30,000	–	30,000
Plant energy costs	5,000	–	5,000
Indirect manufacturing labour costs	10,000	16,000	26,000
Other indirect manufacturing costs	<u>8,000</u>	<u>24,000</u>	<u>32,000</u>
Cost of goods manufactured	<u>€193,000</u>	<u>€40,000</u>	<u>€233,000</u>
Average unit manufacturing cost:	= €233,000 \div 100,000 units		
	= €2.33 per unit		
Finished goods stock in units:	= <u>€20,970 (given)</u>		
	€2.33 per unit		
	= 9000 units		

3. Units sold in 2018 = Opening stock + Production – Closing stock

$$= 0 + 100,000 - 9000 = 91,000 \text{ units}$$

Selling price per unit in 2018 = €436,800 ÷ 91,000

$$= €4.80 \text{ per unit}$$

4.

Revenues (91,000 units sold × €4.80)		€436,800
Cost of units sold:		
Opening finished goods, 1 January 2018		€ 0
Cost of goods manufactured	<u>233,000</u>	
Cost of goods available for sale	233,000	
Closing finished goods, 31 December 2018	<u>20,970</u>	<u>212,030</u>
Gross margin		224,770
Operating costs:		
Marketing, distribution and customer-service costs	162,850	
Administrative costs	<u>50,000</u>	212,850
Operating income		€ <u>11,920</u>

Note: Although not required, the full set of unit variable costs are:

Direct materials costs	€1.40	
Direct manufacturing labour costs	0.30	
Plant energy costs	0.05	per unit manufactured
Indirect manufacturing labour costs	0.10	
Other direct manufacturing costs	0.08	
Marketing, distribution and customer-service costs	1.35	per unit sold

2.25 Revenue and cost recording and classifications, ethics. (25–30 min)

1. Concerns include:

- a. Total payments made by Aran Sweaters do not ‘appear’ to be adequately described. Elements of ‘total compensation’ appear to be:
 - €12 million payment to O’Neil in Achill Island,
 - €4.8 million payment to O’Neil subsidiary in Switzerland and
 - Assistance with life insurance plans for ‘O’Neil executives at rates much more favourable than those available in Achill Island’.

One possible motivation for restricting the payment in Achill Island to €12 million is to avoid showing higher profits in Achill Island. A second motivation could be that the Swiss subsidiary is siphoning off revenues to O’Neil senior executives that should be paid to O’Neil. This could arise if the O’Neil Swiss subsidiary is ‘owned’ by the senior executives of O’Neil rather than being a 100% subsidiary of O’Neil.

The assistance with the insurance plans is in the grey area. If O'Neil is willing to accept a lower price in return for Aran Sweaters assisting with the insurance plans, it may be a judicious economic decision by Aran Sweaters. Aran Sweaters is not hurt economically in this scenario. The concern is whether Aran Sweaters is assisting the senior executives to divert 'de facto' payments to themselves.

- b. Product design costs of Aran Sweaters include €4.8 million for 'own product design'. It is stated that the director of product design views it 'as an "off-statement" item that historically he has neither responsibility for nor any say about' and that 'to his knowledge, O'Neil uses only Aran Sweaters designs with either zero or minimal changes'. It may be that the €4.8 million payment is a hidden payment made to avoid Achill Island taxation. However, the result is incorrect classification of product design costs at Aran Sweaters.
- c. O'Neil receives from Aran Sweaters the margin between €16.8 million (€12 million + €4.8 million) and the €3 million payment for wool, that is €13.8 million. Note that Aran Sweaters can assist O'Neil to meet the 25% ratio of 'domestic labour costs to total costs'. Charging €6.00 million for wool and receiving €19.8 million for sweaters will result in the same €13.8 million margin but will mean O'Neil will not meet the 25% test as total costs will now be €13 million instead of €10 million. Aran Sweaters has to ensure it takes an arm's length in its approach to supply contracts and purchase contracts or else it may be accused by the Achill Island government of assisting O'Neil to avoid local taxes.

Note: Some students will ask whether O'Neil should be able to classify labour fringe benefits as a domestic labour cost. This is not Sheridan's domain given that she is controller of Aran Sweaters. Her concern with the Achill Island tax rebate is whether Aran Sweaters is being 'pressured' to adjust its billing amounts to facilitate O'Neil to have a ratio of 'domestic labour costs to total costs' exceeding 25%. If you want to discuss this issue, point out that labour-fringe benefits are typically an integral part of labour costs. Hence, if they can be traced, O'Neil is justified in including them in domestic labour costs.

- 2. There are a variety of ethical issues relating primarily to competence and integrity that Sheridan faces:
 - a. Is Aran Sweaters assisting O'Neil to avoid income taxes in Achill Island either:
 - by funnelling €4.8 million to a Swiss company rather than to O'Neil in Achill Island or
 - by understating both the €3 million wool supply cost and the €16.8 total revenue amount?
 - b. Is Aran Sweaters assisting senior executives of O'Neil to enrich themselves at the expense of the shareholders of O'Neil?
 - c. Are the accounting records of Aran Sweaters properly reflecting the underlying activities?

3. Steps Sheridan could take include:
 - a. Seeking further information on why the €4.8 million payment is being made to the Swiss subsidiary. This should be done first internally and then by speaking to O'Neil executives.
 - b. Ensure product design costs at Aran Sweaters reflect actual product design work. The so-called 'off-statement' items should be eliminated if no adequate explanation can be given for them.
 - c. Ensure Aran Sweaters personnel follow any company guidelines about supply relations or customer relations. There is nothing inherently wrong with assisting O'Neil negotiate a better insurance package for its executives. The concern is whether developing a 'too cosy' relationship will lead to more questionable practices being overlooked.