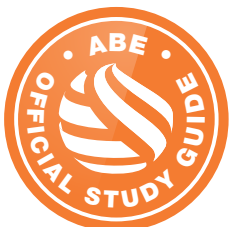


Your road to success

LEVEL 5 INNOVATION AND BUSINESS PERFORMANCE



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Using your study guide

Welcome to the study guide for **Level 5 Innovation and Business Performance**, designed to support those completing their ABE Level 5 Diploma.

Below is an overview of the elements of learning and related key capabilities (taken from the published syllabus).

Element of learning	Key capabilities
Element 1 – Measuring business performance	<p>Ability to apply performance measurement techniques</p> <p>Ability to recommend monitoring metrics</p> <p><i>Critical thinking, problem posing, problem solving using appropriate quantitative and qualitative skills, research skills, data analysis</i></p> <p><i>Critical reflection and evaluation, numeracy, information retrieval</i></p> <p><i>Communication and reporting</i></p>
Element 2 – Adopting innovation	<p>Ability to identify sources, drivers and patterns of adoption of innovation in goods, services and ideas</p> <p>Ability to analyse models and integrate theory and practice</p> <p>Commercial awareness (i.e. of key trends and features of the current business environment.)</p> <p><i>Innovation, analysis, commercial awareness, critical thinking</i></p>
Element 3 – Managing innovation and its impact on business performance	<p>Ability to assess the information requirements needed to manage the levels of innovation within an organisation.</p> <p><i>Information retrieval, synthesis and evaluation of data and information, adopting innovation, managing innovation</i></p>
Element 4 – Managing risk in innovation	<p>Ability to evaluate the risks and uncertainties that innovation creates for business performance and ascertain the business impact</p> <p>Appreciation of ethical and legal issues, commercial awareness (of the implications of risk and uncertainty)</p> <p><i>Communication, risk management, responsibility, evaluation, ethical awareness</i></p>

This study guide follows the order of the syllabus, which is the basis for your studies. Each chapter starts by listing the syllabus learning outcomes covered and the assessment criteria.

L5 descriptor

Knowledge descriptor (the holder...)	Skills descriptor (the holder can...)
<ul style="list-style-type: none">• Has practical, theoretical or technological knowledge and understanding of a subject or field of work to find ways forward in broadly defined, complex contexts.• Can analyse, interpret and evaluate relevant information, concepts and ideas. Is aware of the nature and scope of the area of study or work.• Understands different perspectives, approaches or schools of thought and the reasoning behind them.	<ul style="list-style-type: none">• Determine, adapt and use appropriate methods, cognitive and practical skills to address broadly defined, complex problems.• Use relevant research or development to inform actions. Evaluate actions, methods and results.

The study guide includes a number of features to enhance your studies:



'Over to you': activities for you to complete, using the space provided.



Case studies: realistic business scenarios to reinforce and test your understanding of what you have read.



'Revision on the go': use your phone camera to capture these key pieces of learning, then save them on your phone to use as revision notes.



'Need to know': key pieces of information that are highlighted in the text.



Examples: illustrating points made in the text to show how it works in practice.

Tables, graphs and charts: to bring data to life.

Reading list: identifying resources for further study, including Emerald articles (which will be available in your online student resources).

Source/quotation information to cast further light on the subject from industry sources.

Highlighted words throughout denoting **glossary terms** located at the end of the study guide.

Note

Website addresses current as of September 2017.

Chapter 1

Measuring Business Performance

Introduction

The past 20 years have seen exponential growth in **innovation**, particularly within the technology industry.

Organisations that didn't exist 10 years ago have now overtaken traditional corporate giants as the market leaders, with high levels of capital value.

The main driver has been the internet, which has been instrumental in prompting changes in the structure of business delivery by providing an operational platform for different forms of organisation and business models.

However, these changes have not come without problems. The "dot.com bubble" of the 1990s saw growth and investment in organisations that were not necessarily performance managed, and the need for innovative products has led organisations to invest in new designs that have not been successful in the marketplace.

This study guide covers two key areas for a modern organisation:

- performance measurement
- innovation within an organisation.

This chapter discusses the role of performance measurement, together with employee behavioural issues and how to manage these. The chapter concludes with recommendations for metrics to measure performances and how key performance indicators (KPIs) can be used to manage a business. The concept of a balanced scorecard is also examined.

Learning outcomes

On completing the chapter, you will be able to:

- 1 **Apply measurement techniques as an aid to business performance**

Assessment criteria

- 1 **Apply measurement techniques as an aid to business performance**

- 1.1 Discuss the role of measurement in the management of business performance
- 1.2 Discuss the behavioural issues that can impact the setting and utilisation of business performance measures
- 1.3 Recommend the basis for developing metrics that are useful for monitoring and measuring business performance
- 1.4 Apply key measures of business performance for specific business functions

Level 5 Innovation and Business Performance

1.1 Role of performance measurement in managing business performance

Performance measurement is used in businesses to assess whether and how well goals are being met. Its primary purpose is to measure the success of a business. It encompasses the collection, analysis and presentation of data at every stage and in every step of the production chain.

This chapter focuses on how measurement can support business performance. It will look at models and methods of measurement and how to select the best forms of measurement system.

Performance in business management

There are two common terms relating to performance in business management:

- **Performance measurement:** This deals with quantitative measures that track an organisation's performance.
- **Performance management:** This deals with the management of the organisation's strategy to achieve its goals.

Over recent years, measurement has changed from taking solely financial measurements to including non-financial measurements. This reflects the need for an organisation to succeed in more areas, including quality, value, customer satisfaction and corporate social policy.

The Input-Process-Output-Outcome framework

The four steps in this framework are:

- 1 Input – everything needed to achieve a specific goal.
- 2 **Process** – the activity that uses the input to deliver the output.
- 3 Output – the goods and services produced from the process.
- 4 Outcome – the effects that occur as a result of the output being produced.

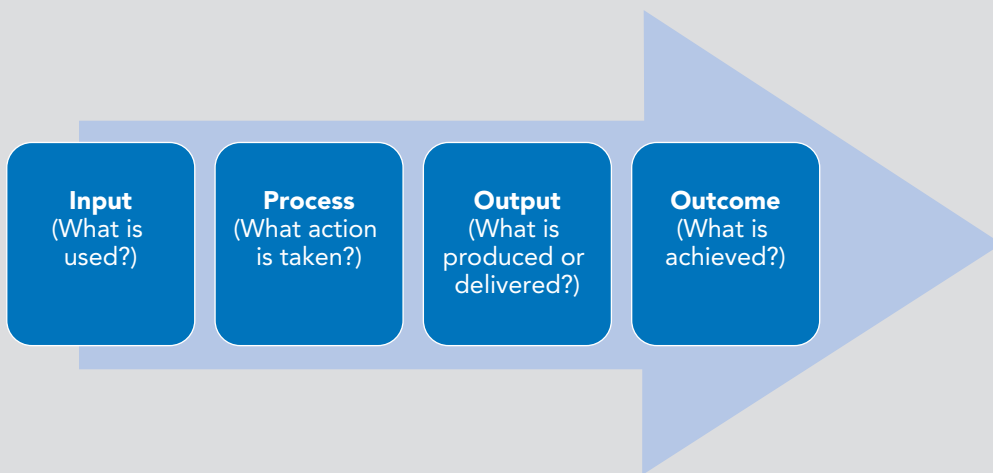


Figure 1: The Input-Process-Output-Outcome Framework



OVER TO YOU

Activity 1: The Input-Process-Output-Outcome framework

Research examples of how this method is applied in two organisations of your choice. One should be local and the other an international organisation. Map out the Input-Process-Output-Outcome framework for each organisation, including as many factors as you can.

How is the Input-Process-Output-Outcome framework used within an organisation?

The framework was traditionally only found in systems analysis and software engineering, but within the business environment today, it is often used in all stages of the production chain, from raw materials being processed to producing an outcome. Therefore, it can be applied to many areas within business.

Mapping out a process using this framework is a good method for measuring the direct effects of a set of inputs on the outcomes.

Some organisations have a fifth stage, "Impact", which looks at the long-term effects of the activity, whereas "Outcome" is the short and medium-term effects.

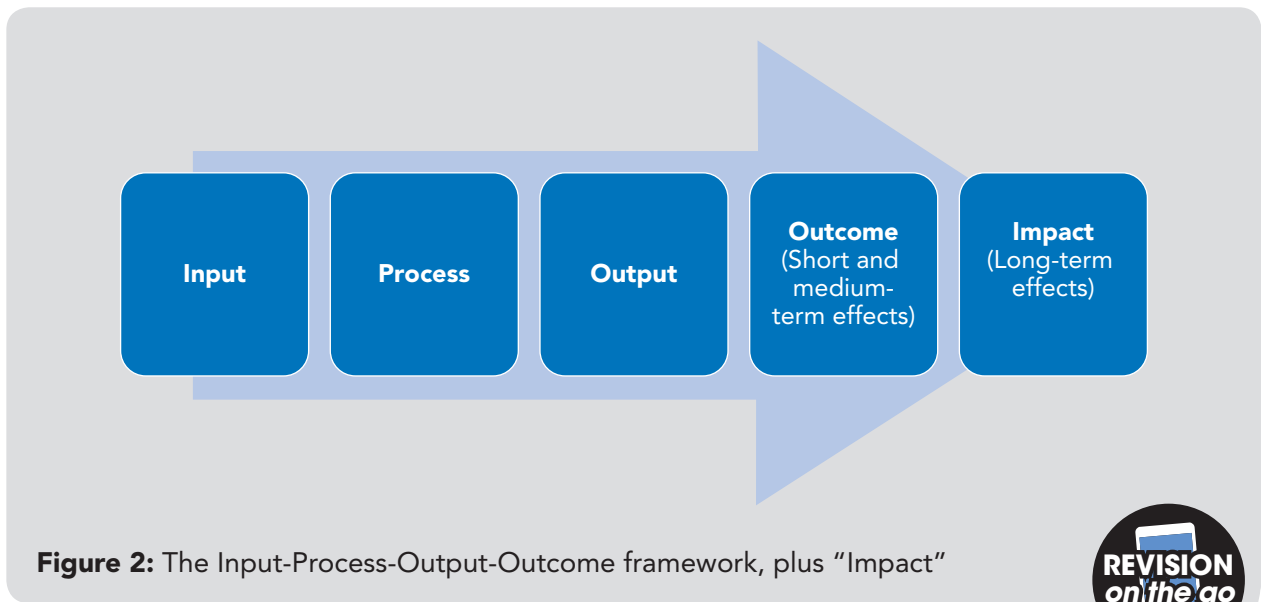


Figure 2: The Input-Process-Output-Outcome framework, plus "Impact"



Understanding the terminology of performance management

Some of the key terms of performance management are defined below.

Efficiency	This compares what is actually achieved with what could be. Often outputs are affected by minor or major issues or waste in the process, so efficient processes make the best use of all resources (or inputs).
Effectiveness	This assesses how successfully objectives are being achieved.
Quantitative data	This is data that can be measured and written down in numbers. Examples include test scores or average heights.
Qualitative data	This is information that records people’s feelings, attitudes and behaviours. Information can be gathered from focus groups, observations and interviews.
Productivity	This describes the efficiency of production. It is a measure of output per unit of input and is often calculated using the classic factors of production – raw materials, enterprise, land and labour.

Table 1: Performance management terminology



Why use complex performance management systems?

The move away from performance measurement based on only financial results means greater complexity and analysis for an organisation. Given that the purpose of trade is to make a profit, why is it that organisations measure many different factors besides financial return?

With the changing nature of trade and business, the bottom line profit figure is not the only priority of an organisation nowadays, particularly with the growth of importance of **stakeholders** who demand more outputs than just profits.

Also, while it is great for an organisation to increase their profitability, if this resulted from a reduction in customer service staff, there might be a short-term gain but a long-term loss as customers do not get responses to their concerns and may alter their purchasing behaviour because of this. Therefore, successful financial figures may only be best in the short term, so other measures are needed.

Additionally, by having more measures, it is possible to identify the micro elements of production so that each step in the value chain can become more efficient.

CASE STUDY

Performance measurement in world shipping

Over 90% of the world's trade activity involves shipping in its value chain.

However, performance measurement is limited to specific areas and there has not been a strong uptake in this form of management despite the size of the market and its importance to economic growth.



Read the article by Nikolaos Otheitis and Martin Kunc (2015), "Performance measurement adoption and business performance: An exploratory study in the shipping industry", *Management Decision*, Vol. 53 Issue: 1, pp. 139–159. (This article will be available in your online student resources.)

This paper looks at the use of performance measurement, the impact it has and how it is being adopted in some areas.

The data covers organisations from Asia, America and Europe and provides insight into a key industry for learners.

Performance measurement of financial data

Financial data is the most commonly used data both inside and outside of an organisation. When annual organisation results are reported, it is the financial position that is key. From reviewing profitability, stakeholders or interested parties will then review data specific to their area of control.

Just as with all performance measurement, it is important to understand the source of the data and any related exceptions or assumptions. All methods of measurement have advantages and disadvantages and it is better to review a combination of measures to get a clearer understanding of a business.

The key areas to measure are

- revenue and profitability
- costs
- growth.

These are generalised groups and will be divided into subsets to allow detailed analysis.

Revenue and profitability

Return on capital employed (ROCE) is a key measure of productivity. It shows the net profit for every \$1 of assets employed, expressed as a percentage:

$$\text{ROCE} = \frac{(\text{net profit} \times 100)}{\text{capital employed}}$$

Other measures include:

Gross profit margin	$= \frac{(\text{gross profit} \times 100)}{\text{turnover}}$
Net profit margin	$= \frac{(\text{net profit} \times 100)}{\text{turnover}}$
EBITDA	= earnings before interest, taxes, depreciation and amortisation
Liquidity	= the availability of cash flow within an organisation
Current ratio	$= \frac{\text{current assets}}{\text{current liabilities}}$
Quick ratio	$= \frac{(\text{current assets} - \text{inventory})}{\text{current liabilities}}$
Financial gearing	$= \frac{(\text{debt} \times 100)}{\text{equity}}$ $= \frac{(\text{debt} \times 100)}{\text{debt and equity}}$

Table 2: Financial measures

REVISION
on the go

Investor ratio

Investor ratios show the ability of businesses to earn a return on investments made by the owners of a company.

Earnings per share	This is the proportion of profit per ordinary share – it is used to assess profitability of a company.
Price/earnings ratio P/E	This is the ratio of the company's share or stock price to the earning per share. It is used to value companies.

Table 3: Investor ratios

REVISION
on the go

Costs

Costs within an organisation can be classified in many ways, including:

- employee costs

- production costs (these show the efficiency of the organisation and it is simple to compare the output with the **capacity** of an organisation)
- support costs (e.g. IT, facilities)
- raw materials
- cost of inventory
- cost of sales including logistics.

It is also important to distinguish between **fixed** and **variable costs**:

- Fixed costs do not vary with changes in production or services; examples include support staff salaries, rent and vehicles.
- Variable costs change in relation to changes in production or services, such as input (raw) materials, energy consumption and packaging.

By measuring costs and understanding their nature, businesses can see where efficiencies can or cannot be made and budgets can be planned based on facts, **benchmarking** and good analysis.

Growth

This can be measured in many ways depending on the nature and needs of the organisation, and can include a mix of financial and non-financial data. Examples include:

- market share
- increase in sales
- increase in profit
- shareholder funds (value of what the business owns – i.e. its assets minus its liabilities)
- customer retention (or growth)
- customer lifetime value
- workforce growth
- cash flow growth.

Therefore, the growth metrics chosen are based on both the nature of the organisation and its goals.



OVER TO YOU

Activity 2: Organisational reports

**Look at the financial data for two organisations of your choice.
List the data that is available and compare it over the past three years.
What does this tell you about the organisation?**

Benefits to the organisation from performance measurement

Performance measures help an organisation:

- identify and track objectives;
- find opportunities for improvements;
- compare against standards, either within a larger organisation or against industry standards;
- set sales prices correctly as unit costs are correctly understood and calculated.

Therefore, performance measurement doesn't solely look backward but it assists organisations in their plans going forward.

! **NEED TO KNOW**

```

graph LR
    A[Performance measurement] -- leads to --> B[Performance management]
            
```

Figure 3: The relationship between performance measurement and performance management

The performance measurement system benefits four sectors, as shown in Figure 4.

Organisation Better control and accountability Improved performance	Managers Clear targets to focus upon Team responsibility
Stakeholders Clearer understanding of organisation	Employees Personal accountability Linked to pay bonuses

Figure 4: The four sectors benefitting from the performance measurement system

Performance measurement that is linked to the award of bonuses for team success encourages employees to work together on common organisational objectives, not just their personal objectives.

Often, bonuses are paid on the achievement of a combination of personal and organisational objectives. Having clear performance measures encourages the achievement of these objectives and therefore any related bonus payments.

OVER TO YOU

Activity 3: Worked example of performance measurement for Phonebitz Ltd.

Look at the following balance sheet and profit and loss account for Phonebitz Ltd., a smartphone accessories store, and complete the task described below.

Balance sheet as at 31 December 2016:

	31 Dec 2016		31 Dec 2015	
	\$'000	\$'000	\$'000	\$'000
Fixed assets				
Land and buildings		50		25
Fixtures and fittings		25		20
		75		45
Current assets				
Stock	10		5	
Debtors	15		10	
Cash at bank	5		5	
	30		20	
Current liabilities				
Creditors	(10)		(10)	
Net current assets		20		10
Long-term liabilities				
Bank loan		(30)		(30)
Net assets		65		25
Financed by:				
Capital		10		10
Retained profit		55		15
Capital employed		65		25

Profit and loss account for year ending 31 December 2016:

	Y/E 31 Dec 2016		Y/E 31 Dec 2015	
	\$'000	\$'000	\$'000	\$'000
Revenue		125		100
Cost of goods sold		25		20
Gross profit		100		80
Operating expenses				
Salaries	15		15	
Depreciation	10		10	
Rent and rates	10		5	
Other expenses	5		5	
Total expenses		40		35
Operating profit		60		45
Interest	5		5	
Tax	15		10	
		20		15
Net profit		40		30

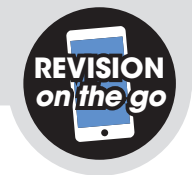
Based on the definitions provided, calculate the ratios for Phonebitz Ltd. for 2016 and 2015 using the spaces in the table below. (Guidance is provided at the end of the study guide, but you are recommended to attempt the calculations yourself first.)

Measure	Definition	2016 calculation	2015 calculation
Return on capital employed (ROCE)	$\frac{(\text{Net profit} \times 100)}{\text{capital employed}}$		
Gross profit margin	$\frac{(\text{Gross profit} \times 100)}{\text{revenue}}$		
EBITDA	Earnings before interest, tax, depreciation and amortisation		
Current ratio	$\frac{\text{Current assets}}{\text{current liabilities}}$		

Balanced scorecard (BSC)

The balanced scorecard is a well-known system of performance measurement which is used in strategic management, developed by Kaplan and Norton (1992)¹. This sets out the drivers and outcomes of goals and performance management through “key indicators” within the balanced scorecard and demonstrates if these are meeting the needs of an organisation.

A BSC measures lagging events (what has previously happened) and leading indicators, which are measures that look forward in time and will affect the business strategy going forward. There are four key terms in the BSC as shown in the diagram below:



A balanced scorecard generally focuses on four key elements:

- financial
- customer
- process
- staff.

These are used to form a strategy map, which is a visual summary of the scorecard.

¹ Kaplan, R. S., and Norton, D. (1992), “The Balanced Scorecard: Measures that Drive Performance”, *Harvard Business Review*, Vol. 70, Issue 1, pp. 71–79

Elements	Business objectives	Key performance indicator (KPI)	Targets
Financial	Increase revenue	Operating cost	↑ 3%
		Sales revenue	↑ 5%
Customer	Improve customer experience	Customer satisfaction index	↑ 5%
		Customer complaints	↓ 6%
Process	Improve internal despatch time	Click to despatch times	↑ 10%
Staff	Improve staff skills level	Days training	↑ two days
		Completion of personal development plan (PDP)	100%

Table 4: Example of a balanced scorecard



Therefore, the BSC brings a strategy to life for stakeholders and employees with an easy-to-communicate plan (using their strategy map) and enables the organisation to track their performance. It is a measurement system adopted by many organisations.

OVER TO YOU

Activity 4: Using the balanced scorecard

Research three organisations that use the BSC. Internet research is best for this. What are the measures they are using?

1

2

3

CASE STUDY

The uses of the balanced scorecard

There is a very interesting article available in your online student resources that is relevant here:

Marvin Soderberg, Suresh Kalagnanam, Norman T. Sheehan, Ganesh Vaidyanathan, (2011), "When is a balanced scorecard a balanced scorecard?", *The International Journal of Productivity and Performance Management*, Vol. 60 Issue: 7, pp. 680–708.

This article highlights the importance of a balanced scorecard within organisations and how they can be used effectively.



1.2 Behavioural issues that can impact the setting and utilisation of business performance measures

Setting targets and using systems to measure performance in all areas of the business is a vital part of delivering success. However, these targets are often set and met by employees. Therefore, employee behaviour can affect whether measures are met, or even set correctly.

This section covers behavioural impacts on performance measures and the systems that can be introduced for performance measurement.

Importance and benefits of setting appropriate objectives

Appropriate targets and objectives are key to ensuring that the business has a way of monitoring its own performance.

It is important that the measurements chosen are SMART (specific, measurable, achievable, realistic and time-bound) but there are other elements to consider, such as:

- **Buy-in from the team:** It is acceptable within HR and business practice to have agreed "stretch targets" (i.e. ones that are deliberately designed to challenge the team) but the team needs to view these as achievable.
- **Accountability for performance:** A team cannot have ownership of their results if they are not accountable for them.
- **Cost:** The system must be cost effective in both time and running costs.
- **Simplicity:** The system needs to be easy to understand and report.
- **Links to strategy:** If a measure does not link directly to the strategy of an organisation, then either the measurement needs to be considered or the strategy does (or both).

- **Regularly reviewed:** This means the measurement must be easy to review and there must not be a long-term effect (known as a lag effect) for data collection. This ensures remedial action can be taken as fast as possible, if necessary.

Behavioural factors – setting goals

Locke and Latham (2002)² found that setting effective targets results in a higher chance of performing well. The principles of setting effective targets are:

- clarity
- challenge
- commitment
- feedback
- task complexity.



² Locke, E.A., and Latham, G.P. (2002). "Building a practically useful theory of goal setting and task motivation: A 35-year odyssey", *American Psychologist*, Vol. 57, pp. 705–717

CASE STUDY

Behavioural factors

This interesting case study provides useful theories on behavioural factors when measuring performance:

Vanja Bevanda, Giorgio Sinković and David M. Currie (2011), "Implementing a performance measurement system in Croatia", *Measuring Business Excellence*, Vol. 15 Issue: 4, pp. 50–61. (This article will be available in your online student resources.)



Setting challenging goals can result in unethical behaviour and cause harm. Ordonez et al. (2009)³ discussed how behaviours can be distorted due to setting unachievable targets.

This can also be linked to financial rewards, such as bonuses, for achievement of these objectives, thereby making some employees break rules to reach their objectives and obtain greater pay-outs.

Examples such as mis-selling scandals have highlighted when measures have been set that create poor behaviour, as shown in the case study below.

CASE STUDY: MIS-SELLING PENSIONS IN THE UK

Behavioural issues in target setting for employees

In 1988, changes in the UK pension framework meant employees could opt out of the state pension and set up private plans, known as a personal pension.

There was a period of intense selling of these plans by insurance companies and in the next six years, 5.5 million employees swapped their state pension for private plans. There were incentives to take this action but it became clear that many who switched became substantially worse off, losing benefits and large amounts of pensionable income.



After an investigation by regulatory bodies and the Pension Law Review Committee, established by the UK government in 1991, it was found that highly misleading advice had been used to sell pension schemes to customers.

Many who switched were unaware of the disadvantages and did not know of the additional costs to rectify their pension arrangements.

Many pension schemes' sales representatives worked on a commission-only basis, and used aggressive and misleading sales tactics to boost their own performance and income.

³ Ordóñez, L., Schweitzer, M. E., Galinsky, A. D., and Bazerman, M. H. (2009). "Goals gone wild: How goals systematically harm individuals and organizations." *Academy of Management Perspectives*, Vol. 23, Issue 1, pp. 6–16

Read this article:

Roger Bennett and Helen Gabriel (2001), "Corporate reputation, trait covariation and the averaging principle – The case of the UK pensions mis-selling scandal", *European Journal of Marketing*, Vol. 35 Issue: 3/4, pp. 387–413 (This article will be available in your online student resources.)

The article highlights reputational issues of mis-selling pensions in the UK and is useful to study the impact of targets on poor employee and corporate behaviour.

Challenges faced when selecting and applying performance measures

The main challenges that businesses face in setting performance measures are:

- identifying what should be measured;
- obtaining the resources for a measurement system;
- communicating the metrics;
- designing a flexible system;
- building in bias for bonus-worthy measures.

Of these challenges, it is important to understand how to identify what should be measured and how to design a flexible system.

Identification

A measure contains four components:

- Indicator – what change is to be measured.
- Unit of measure – how the indicator is quantified.
- Baseline – starting point for measurement.
- Target – desired performance.

However, in trying to achieve the desired level of performance, it is important that increased efficiency does not result in a decrease in quality, and that the measure is not selected only because it is accessible and easy to achieve.

Designing a flexible system

There are many models for designing a performance management system; Wisner and Fawcett's⁴ model is commonly used. It is a nine-step process as shown in Figure 7.

⁴ Wisner, J.D. and Fawcett, S.E. (1991), "Link firm strategy to operating decisions through performance measurement", *Production and Inventory Management Journal*, Third Quarter, pp. 5–11



Source: Adapted from Wisner and Fawcett's model

Figure 7: Designing a performance measurement system



In summary, these steps are:

- 1 Agreeing a corporate or divisional mission statement.
- 2 Identifying and communicating strategic objectives for the organisation.
- 3 Understanding functional areas of the organisation and how they work together.

For this, an organisation needs to look at how they work together and communicate, in particular they need to look at the impact of the structure on functional working.

4 Develop performance measures for each function.

These should be SMART goals (specific, measurable, achievable, realistic and time-bound).

5 Communication of the goals to key stakeholders.

These should primarily be within the organisation but the roles of stakeholders (including the board) cannot be overlooked as part of the communication process.

6 Assure consistency with strategic objectives.

It is vital that the performance measures match the strategic objectives and goals of the business.

For example, if objectives are to improve customer service and profitability, the measure cannot solely concern profit, which could be improved with short-term actions that have long-term detrimental effects on customer service.

7 Assure compatibility of performance measures.

As with the example of performance measurement and profit, all measures must be achievable without damaging the performance in other measured areas. For example, setting ethical supply chain rules may affect the lead time for delivery of raw materials due to improvements by or changes in the supplier. Therefore, one target will negatively affect another. So, it is key to ensure that the interaction of performance measures will either be neutral or positive, rather than negative.

8 Use the system to identify competitive position and locate problems.

As a result of performance measures, benchmarking and competitor comparison can be used in order to see what is working well and what needs to be improved. With measures developed to many parts of the organisation, focus on smaller departments which may have a significant impact on business performance can be achieved.

9 Periodically re-evaluate the appropriateness of PM system.

As with all systems, re-evaluation of systems is important to ensure an organisation is correctly setting measurement targets and focusing on areas that make a significant difference. Therefore, reviewing the system is as important as the system itself.

A study by Neely et al. (1995)⁵ focuses on how the performance measurement system needs to interact with the internal and external environment.

For the **internal environment**, the measurement system must align with the strategic goals but it also links the goal-setting process, feedback and reward (or sanction).

It must also ensure that different functions are not rewarded for different targets that disadvantage one function; for example, in a factory, if the maintenance team have been given a target to fix all faults within two working hours, with the cost being passed to the production team, the latter may not meet its cost targets – particularly if the maintenance team has to resource temporary, expensive contractors. By having an approach to performance management that looks at organisation-wide goals, this can be reduced or avoided. This is known as goal **congruence**.

For the **external environment**, comparing performance to that of competitors and benchmarking make the setting of performance targets more realistic, assuming this information is available. This allows a system to be relevant and responsive to changing customers, and competitors' needs.

⁵ Neely, A., Gregory, M., and Platts, K. (1995), "Performance measurement system design: A literature review and research agenda", *International Journal of Operations & Production Management*, Vol. 15 Issue: 4, pp. 80–116

CASE STUDY

Performance measurement system design

For more information on the challenges of performance measurement, read this paper:

Andy Neely, Mike Gregory and Ken Platts (1995), "Performance measurement system design: A literature review and research agenda", *International Journal of Operations & Production Management*, Vol. 15 Issue: 4, pp. 80–116 (This article will be available in your online student resources.)

This covers the setting up of a performance measurement system and the best way to implement it. It provides useful evidence and experience for learners to study.



Using metrics

A **metric** is a system of measurement. There needs to be individual metrics put in place for each category to be measured when it comes to performance measurement.

These are commonly called key performance indicators (KPIs). In business, reference is also made to service level agreements (SLAs) – these do not directly measure performance but it is important to understand what SLAs are and how they are used.

Service level agreement (SLA)

A service level agreement is put in place to ensure that an organisation is focused on meeting the expectations of its customers. It sets the standards of service that are required and includes elements such as timescales and quality assurance. It should be reviewed regularly by the organisation to check whether these standards should be altered based on customer feedback.

SLAs also outline how to solve problems, such as if a customer does not receive the service or goods they paid for as expected.

They can be used for internal and external customers.

When used within an organisation (i.e. in relation to internal customers), they are helpful in ensuring that one department does not become complacent or prioritise other work over another department's needs.

Examples include:

- two-hour call-out for emergencies if issue reported between 9–5 p.m., Monday to Friday;
- telephone support 9–5 p.m., Monday to Friday, with answer phone and message facility out of hours;
- weekly systems "health check", run in accordance with the contract.

SLAs are therefore used as generic measures in performance measurement, rather than specific detailed metrics, where KPIs are more appropriate.

Key performance indicator (KPI)

Key performance indicators are used to measure specific business outcomes linked to organisational targets. Like all targets, they should be set to the SMART standard.

A KPI sets standards as well as how and when they will be measured. There are three aspects to a KPI: what is being measured, who is doing the measuring, and when the measuring occurs. Some examples of KPIs include:

- reducing customer complaints to x%;
- increasing the number of new customers by y%;
- reducing employee turnover to 5%;
- increasing sales by 7%;
- reducing budgeted transportation costs by 10%.

! NEED TO KNOW

Differences between SLA and KPIs

An SLA is an agreement to define the standards of a service.

A KPI is a measurement of performance to evaluate the success of an activity.



1.3 Basis for developing metrics that are useful for monitoring and measuring business performance

Key business drivers

Business drivers are the factors that are vital for the success of a business, including resources and processes. The drivers for each business are different and it is important that a business identifies these drivers so they can maximise their growth potential.

As there is a range of both internal and external factors that affect performance, discovering the key drivers of a business allows more time to be spent addressing the factors that have the biggest influence.

The most common key drivers are based around sales, costs, customers and cash flow. Other important drivers are profitability, **sustainability** and **corporate social responsibility (CSR)**. The nature of the business will affect how these are measured and what additional metrics are used.

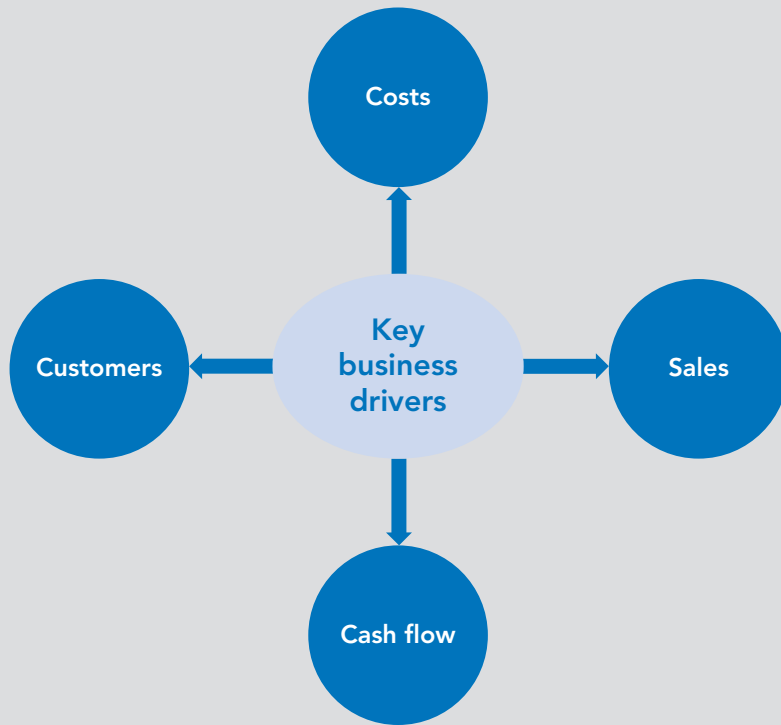


Figure 8: Key business drivers



These key business drivers:

- have the biggest impact on the performance of a business;
- have the biggest impact on growth and the ability to grow;
- are measurable;
- are comparable so you can see changes.

! NEED TO KNOW

Key drivers determine your key performance measures

Examples of businesses and their key drivers:

Driver	Law firm	Food seller
Cost	Wages costs	Reduce food waste
Cash flow	Increase in timely payment	Sales on credit
Sales	Increase billable hours	Number of sales

Table 5: Businesses and their key drivers



Identifying key drivers

This is a difficult task due to the variability of businesses and the markets they work in.

A good method starts with asking questions about the business drivers, focusing on the three key areas (cost, cash flow and sales) and adding questions about key support functions:

- 1 What drives profitable growth?
- 2 What drives waste?
- 3 What drives liquidity (cash flow)?
- 4 What drives employees to work to their potential?
- 5 What drives excellent customer service?
- 6 What drives performance?



OVER TO YOU

Activity 5: Key business drivers

You are the chief financial officer (CFO) of a start-up business selling educational books via the internet. You have been trading for two months. Consider 10 key drivers for your business that you will use for the next 12 months.

1

2

3

4

5

6

7

8

9

10

Using relevant and meaningful performance measures

Organisations, both large and small, can use many metrics to assess the performance of their business. However, it is often too costly and time-consuming to assess large amounts of performance measurement data. Therefore, the performance measures need to be relevant and meaningful. That means basing most around the key drivers for each particular organisation.

If business drivers are the key to success and growth, then these must be used as base performance measures.

Key business drivers

Key business drivers are divided into profit and non-profit drivers. Remember these are **factors**, not measurements that affect growth and performance.

Examples of profit drivers, usually expressed as a monetary amount or percentage, are:

- Price
- Fixed costs
- Sales

Examples of non-profit drivers:

- Customer satisfaction
- Staff retention
- Accident levels



Linking drivers, measures and KPIs

This chapter describes key areas of performance measurement. It is important to understand how they all link together. Figure 9 shows the relationship between them.

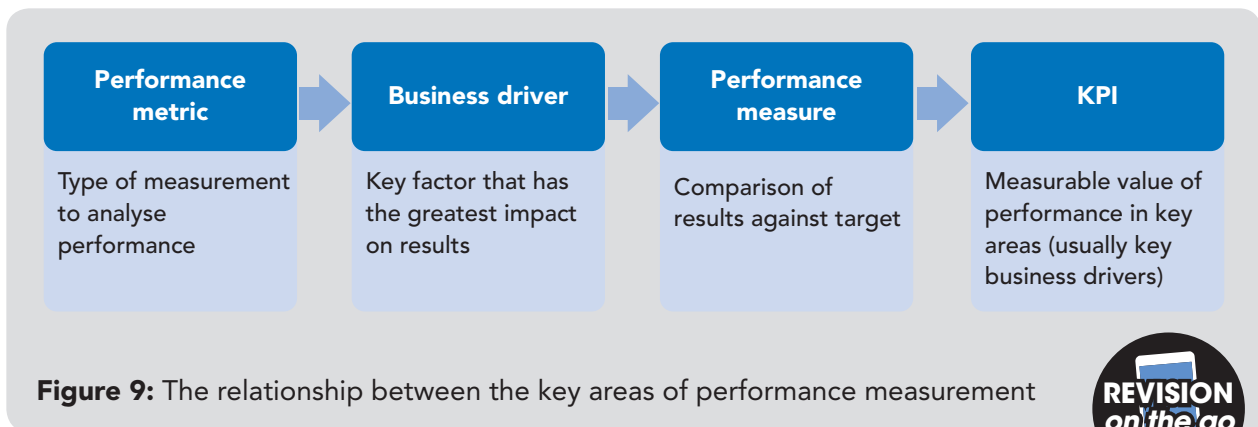


Figure 9: The relationship between the key areas of performance measurement



Features of a performance measurement system

Feature	Reason	Comments
Relevant	The measures must be linked to the key drivers if they are to have the greatest impact on performance.	An online business needs to measure website traffic rather than the fixed cost of premises.
Consistent	As the strategy is set for several years, the measurements should be consistent. It is possible to alter these midway but only by making corrections rather than an overhaul.	If sales per agent is measured one year and sales per team the next, there may a disincentive for all to work as hard.
Reliable	Faith in the figures is necessary for the whole workforce to trust that their work is being accurately measured and reported.	Any issues highlighted through data collection should be acted upon immediately so the business is confident of their results.
Cost effective to measure	Expensive and detailed systems with complicated measures often miss the purpose of measurement – the key measures have the most impact so time should be spent on these.	Spending time on the 10 key measures – focussing on cost, sales and cash flow and other key indicators will be more worthwhile.

Table 6: Features of a performance measurement system



CASE STUDY

Strategy execution – five drivers of performance

Read this article:

Vincent Sabourin (2015), "Strategy execution: five drivers of performance", *Journal of Strategy and Management*, Vol. 8 Issue: 2, pp. 127–138 (This article will be available in your online student resources.)

This useful study looks at an analysis of key business drivers in businesses in Canada. It provides good background reading on the topic.



Common mistakes when devising the performance measurements

Implementing performance measurement systems is a key step for a business in taking greater control to reach its strategic goals. However, over-measuring can be as problematic as no measurement or under-measuring.

Common issues to avoid are summarised in Table 7 below.

Measuring too much	Instead of measuring on too large a scale, like considering the overall cost of staff, it is more important to focus on fewer, significant measures.
Collating information that is already available	Instead of introducing new schemes, the measures that you need may already be available in a different format.
Poor presentation of the information	By designing simple presentation formats, the results may be better understood.
Using measures that cannot be controlled	Metrics that cannot be changed by the business (such as the weather) should not be measured.
Using metrics that may not apply to everyone	Turnover, for example, may not be an issue at junior level but may have a greater impact at senior level.
Too many measures	The key drivers get overlooked with so many other measures.
Relying on lagging indicators	Using data from previous years to measure current performance which might not be repeated. Therefore, the performance measure might need to be improved.

Table 7: Common issues of over-measuring



Other issues

In common with all quality organisations, the concept of “Plan, Do, Check, Adjust”, first discussed by Deming⁶, should be applied to performance measurement too. The system should be regularly benchmarked and tested by asking users if they are happy with:

- the method of reporting results;
- the measures;
- the presentation of data;
- the communication of results.

This will ensure that the performance measurement process is continually servicing its needs and providing the key information to ensure achievement of its strategic goals, such as continued business growth and success.

Cost to measure

Costs may arise from a new system of performance measurement due to:

- implementation of a new system;
- training staff to understand their roles in the new system;
- cost of time to analyse data;
- audit of results to ensure the system is contributing to business growth;
- changes to the system (requiring time and analysis).

Therefore, the system needs to be simple and effective, and the measures need to be cost-effective to implement and not too time-consuming to train employees how to use.

CASE STUDY

Performance measurement initiatives in the Indian Government



This is an interesting personal assessment of introducing performance measurement into a public-sector body:

Seema Joshi, (2015), “Service sector statistics in India: problems and way forward”, *World Journal of Science, Technology and Sustainable Development*, Vol. 12 Issue 2, pp. 148–154 (This article will be available in your online resources.)

It is a useful read for the issues and learning points of a key change.

⁶ Deming, W. E. (1993), *The New Economics for Industry, Government, and Education*, p. 132. Boston, MA: MIT Press

! NEED TO KNOW

Designing your system

Ensure that your performance management system:

- covers your whole business;
- identifies your key business drivers;
- includes measures that are sensitive to budget changes;
- has a manageable number of metrics;
- has SMART KPIs;
- checks data is timely, easily and cheaply available;
- checks your measures are maintaining quality;
- has easy-to-understand results;
- has a clear communications plan;
- is reviewed regularly to check the system is meeting business needs.



1.4 Key measures of business performance for specific business functions

Benchmarking

With a performance measurement system in place, as with many areas of business, it is important to test it by comparing with similar organisations.

Benchmarking is the process of looking outside the business to see how others act. It helps businesses to see how performance levels are attained, what processes they use and if there are systems and processes that can be mirrored to improve output.

By looking at other organisations, it helps a business to evaluate their own methods and see gaps in performance.

! NEED TO KNOW

Types of benchmarking

Strategic benchmarking involves comparing current strategies with those of successful, high-performing organisations.

Performance benchmarking covers the performance of organisations within the same sector. This is often conducted through trade institutes and associations.

Internal benchmarking reviews operations within the same organisation, such as business units on different sites.

External benchmarking analyses the methods employed by world-class organisations to see if they could be emulated.



Within performance management, the focus should be on both internal and external benchmarking.

Internal benchmarking is the reviewing of processes and productions within the same business. This is suitable for large organisations with similar processes within business units or departments. For example, the units could benchmark the payment process of all business units in order to find the best methods to improve payment performance. Sharing of confidential information is agreeable as the business units are part of the same organisation.

External benchmarking is often limited due to an organisation's lack of willingness to share sensitive information or details on their systems and processes. This issue is a limiting factor for information sharing between competitors or external benchmarking.

Usually the best way to benchmark other organisations is via performance benchmarking – that is assessing industry data and available performance measures.

CASE STUDY

KPIs for excellent teachers in Malaysia

Read this case study:

Ismail Hussein Amzat (2017), "Key performance indicators for excellent teachers in Malaysia: A measurement model for excellent teaching practices", *International Journal of Productivity and Performance Management*, Vol. 66 Issue: 3, pp. 298–319 (This will be available in your online resources.)



This study looks at developing KPIs in an industry where few measures have consistently been applied. It is helpful to assist learners in understanding the practical problems of implementing KPIs in eight states within Malaysia where little performance management has been conducted.

The introduction of KPIs is part of a programme to raise the standard of teaching, which will improve educational outputs and eventually affect GDP in Malaysia. This shows a direct link between a KPI and a government (or corporate) objective.

Functional performance measures

Specific functional measures are required to carry out performance measurement. The first step is to agree the business driver and then the KPI. The following measures are common in small and global industries, though smaller businesses usually require fewer measures.

Driver	KPI	Detailed KPI
Cost of recruitment	Average cost of recruitment	For example, average costs per job grade
Recruitment cycle	Average recruitment period	For example, average recruitment period for senior managers For example, average recruitment period for frontline staff

Table 8: Business drivers and KPIs



Additional reading material on the topic of benchmarking and KPIs is detailed in the reading list at the end of this chapter.

Examples of KPIs in functions

The following table provides examples of ways in which to measure functional activities within an organisation. For each, the business will set a target – a percentage, rate or number, which will be measured at each review point. This can be monthly or quarterly.

Finance	<ul style="list-style-type: none"> • Working capital as a percentage of sales • Return on sales • Overdue accounts receivable (AR) as a percentage of total AR • Cost per unit
Business process	<ul style="list-style-type: none"> • Average process overdue time • Average time of completed tasks • Percentage overdue processes • Cost of stopped activities
Compliance	<ul style="list-style-type: none"> • Average time to resolve compliance issue • Percentage compliance in audit • Number of faults completed • Time unresolved compliance issues
Customer service	<ul style="list-style-type: none"> • Number of complaints • Number of escalations • Customer service ratings • Cycle time
Human Resources	<ul style="list-style-type: none"> • Average cost to hire • Average length of service • Training hours per employee • Cost of temporary staff
IT	<ul style="list-style-type: none"> • Alert to resolve ratio • Account creation rate • Network availability • Response success rate
Marketing	<ul style="list-style-type: none"> • Average click through ratio • Brand awareness percentage • Leads generated • Website leads generated

Table 9: Ways to measure functional activities



 OVER TO YOU

Activity 6: Interpreting a balanced scorecard

From the table below, what is your interpretation of the balanced scorecard of this business?

KPI	Aim	Results 2016	Results 2017
Operating margins	Keep strong margins	11.8%	12.0%
Cash flow	Maintain cash flow level	\$4.1m	\$4.2m
Capital expenditure	Keep capex below 5%	3.5%	3.8%
Return on capital employed (ROCE)	Ensure ROCE increases year on year	18.2%	15.8%
Gearing ratio	Low level of gearing under 15×	11×	12×
Staff turnover	Remain under 3%	2.7%	3.2%
CSR index	Remain at over 11%	10.2%	11.2%

Therefore, it is not only the need but the manner in which performance is measured that makes a difference to an organisation. The method, the metric, the communication and the involvement of staff are all important to those working within an organisation but additionally to shareholders and other stakeholders.

Stakeholders may need to review different KPIs but an organisation that fails to effectively monitor their business will not instil confidence in stakeholders and will, in the long term, decline.

READING LIST

- Adewunmi, Y., Omirin, M., Koleoso, H. (2015), "Benchmarking challenges in facilities management in Nigeria", *Journal of Facilities Management*, Vol. 13, Issue 2, pp. 156–184 (This article will be available in your online student resources.)
- Amzat, I. H. (2017), "Key performance indicators for excellent teachers in Malaysia: A measurement model for excellent teaching practices", *International Journal of Productivity and Performance Management*, Vol. 66 Issue: 3, pp. 298–319 (This article will be available in your online student resources.)
- Bevanda, V., Sinković, G., Currie, D. M. (2011), "Implementing a performance measurement system in Croatia", *Measuring Business Excellence*, Vol. 15 Issue: 4, pp. 50–61 (This article will be available in your online student resources.)

- Hanman, S. (1996), "Benchmarking Your Firm's Performance with Best Practice", *The International Journal of Logistics Management*, Vol. 8, Issue 2, pp. 1–18 (This article will be available in your online student resources.)
- Harvey, J. (2008), "Performance Management, Topic Gateway Series No. 9", Retrieved from: www.cimaglobal.com/Documents/ImportedDocuments/9_performance_measurement.pdf [Accessed on: 1 June 2017]
- Neely, A., Gregory, M., Platts, K. (1995), "Performance measurement system design: A literature review and research agenda", *International Journal of Operations and Production Management*, Vol. 15 Issue: 4, pp. 80–116 (This article will be available in your online student resources.)
- Otheitis, N., Kunc, M. (2015), "Performance measurement adoption and business performance: An exploratory study in the shipping industry", *Management Decision*, Vol. 53 Issue: 1, pp. 139–159 (This article will be available in your online student resources.)
- Sabourin, V. (2015), "Strategy execution: five drivers of performance", *Journal of Strategy and Management*, Vol. 8 Issue: 2, pp. 127–138 (This article will be available in your online student resources.)
- Soderberg, M., Kalagnanam, S., Sheehan, N. T., Vaidyanathan, G. (2011), "When is a balanced scorecard a balanced scorecard?" *International Journal of Productivity and Performance Management*, Vol. 60 Issue: 7, pp. 688–708 (This article will be available in your online student resources.)
- The Advanced Performance Institute, n.d., *Creating and Implementing a Balanced Scorecard: The Case of the Ministry of Works – Bahrain*, Retrieved from: www.ap-institute.com/media/4304/creating_and_implementing_a_balanced_scorecard_bahrain.pdf [Accessed on: 1 June 2017]

Summary

This chapter focused upon how performance is measured within an organisation, and what can affect measurement systems, such as behavioural and organisational issues.

By distinguishing between performance measurement and management, the chapter looked at terms used and different measurement systems, allowing an understanding of the benefits of measuring performance.

Case studies provided examples of how and where to apply measurement and ways to overcome difficulties of the system used.

An example of a balance sheet was used to demonstrate how performance is measured at a corporate level, whilst examples of target setting and the use of KPIs showed how measurement can be applied to functions and smaller teams.

Overall, this chapter helped readers understand the need for measurement and how to produce a system that is practical and relevant for teams and organisations.

Chapter 2

Adopting Innovation

Introduction

This chapter looks at the world of innovation, how it is adopted by industries and organisations and the differences that innovation can make. The concept of disruption and how dominant organisations can be overtaken is discussed, together with theories of innovation.

Open and closed innovation will be introduced and discussed, with explanations of how different sectors innovate. Examples are also provided to allow investigation of the key issues relating to performance measurement and innovation.

Learning outcomes

On completing the chapter, you will be able to:

- 2 Discuss the sources, drivers and patterns of adoption of innovation in goods, services and ideas**

Assessment criteria

- 2 Discuss the sources, drivers and patterns of adoption of innovation in goods, services and ideas**
 - 2.1 Explore the concept of innovation and assess its relevance to business performance
 - 2.2 Examine the theories and models of innovation
 - 2.3 Examine the phases in the innovation life cycle of a typical product or service
 - 2.4 Compare and contrast the different adoption patterns of innovation
 - 2.5 Appraise the environmental factors that are relevant to an innovative business undertaking

Level 5 Innovation and Business Performance

2.1 Innovation and its relevance to business performance

The effects of innovation

Research by the National Endowment for Science, Technology and the Arts (**NESTA**, a UK-based organisation focussing on innovation) shows that, on average, organisations that are innovative grow significantly faster than those that are not. In this research, innovative organisations experienced four times the sales growth of non-innovators in their sample.

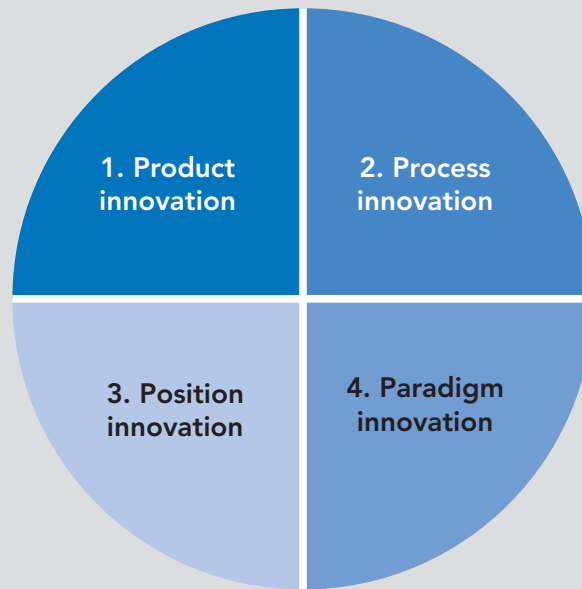
However, innovation can be a drain on physical, human and financial resources for a business, so it is important that it is carefully managed.

There are many examples of new innovations bringing life to a declining business, and breakthrough and disruptive ideas starting a new marketplace. In recent times, this includes the electric car, Dyson vacuum cleaners and smartphones. These have now become consumer favourites in many parts of the world.

It is important to understand the difference between innovation, invention and improvement.

- **Innovation** is a process of changing a product or method of production in order to deliver something new and more valuable to customers.
- **Invention** is the creation of a new product, service, or production method.
- **Improvement** involves finding a better way to produce goods and services, whereas **innovation** involves looking for different methods to change the product or process.

Tidd and Bessant (in Harland, Nassimbeni and Schneller, 2013)⁷ developed the 4Ps of innovation. The model explains that innovation has four stages.



Source: Tidd and Bessant (2013)

Figure 1: The 4Ps of innovation



The 4Ps are:

- 1 Product innovation:** This is the most common form of innovation, where an existing product is adapted to form a new market itself. An example is the Kindle E-Reader, which used the existing market for reading and delivered its product in an innovative way.
- 2 Process innovation:** This looks at improving the process of creating and delivering a product within a market. An example is the development and use of online share trading systems which have radically changed the way individuals and businesses trade and manage portfolios.
- 3 Position innovation:** These changes occur when there are changes in the context in which products and services are introduced. Examples include the delivery of online degrees rather than studying in universities over semesters. This position change moves the student body from, typically, school-leavers to include older professionals.
- 4 Paradigm innovation:** This changes the way that products or services are perceived. The engineering group Dyson changed the perception of home appliances to high performing and highly engineered (and more expensive) products, e.g. the vacuum cleaner and air conditioning unit.

OVER TO YOU

Activity 1: 4Ps of Innovation

Identify and classify some well-known innovations into the categories of the 4Ps: product, process, position and paradigm innovation.

Are there any that you think overlap the categories?

⁷ Harland, C., Nassimbeni, G. and Schneller, E., eds. (2013), *The Sage Handbook of Strategic Supply Management: Relationships, Chains, Networks and Sectors*, Sage

Product:
Process:
Position:
Paradigm:

Innovation – incremental to radical

Within businesses, any innovation will be positioned on a scale from incremental to radical. They can also be stand-alone innovations or part of a chain of improvements. **Incremental innovation** is a series of small steps, usually in a process chain. **Radical** innovation is where the product or process replaces existing systems with something that is new.

How this helps a business

For a business, opportunities can be found by looking at the nature of past innovations, and whether they were positional or process types, which are the two paradigms most commonly used for this. Therefore, there may be opportunities to look at the remaining areas of innovation. Alternatively, the business may be only looking at individual innovations rather than seeing the impact of a chain of changes and improvements.

By using the 4Ps of innovation, it is possible for a business to understand where to focus efforts for improvement.

Problems with innovation

Innovation is often seen as the key to success and many examples of increased profits, market share and expansion are due to innovative products and processes.

However, innovation is costly and risky. Even when a degree of **risk management** has been employed, there are many examples of failed products and ideas which did not progress to the final stages.

A considerable amount of resources (human, financial and physical) can be required, with no guarantee of success. These are discussed further in Chapter 4, Section 4.2.

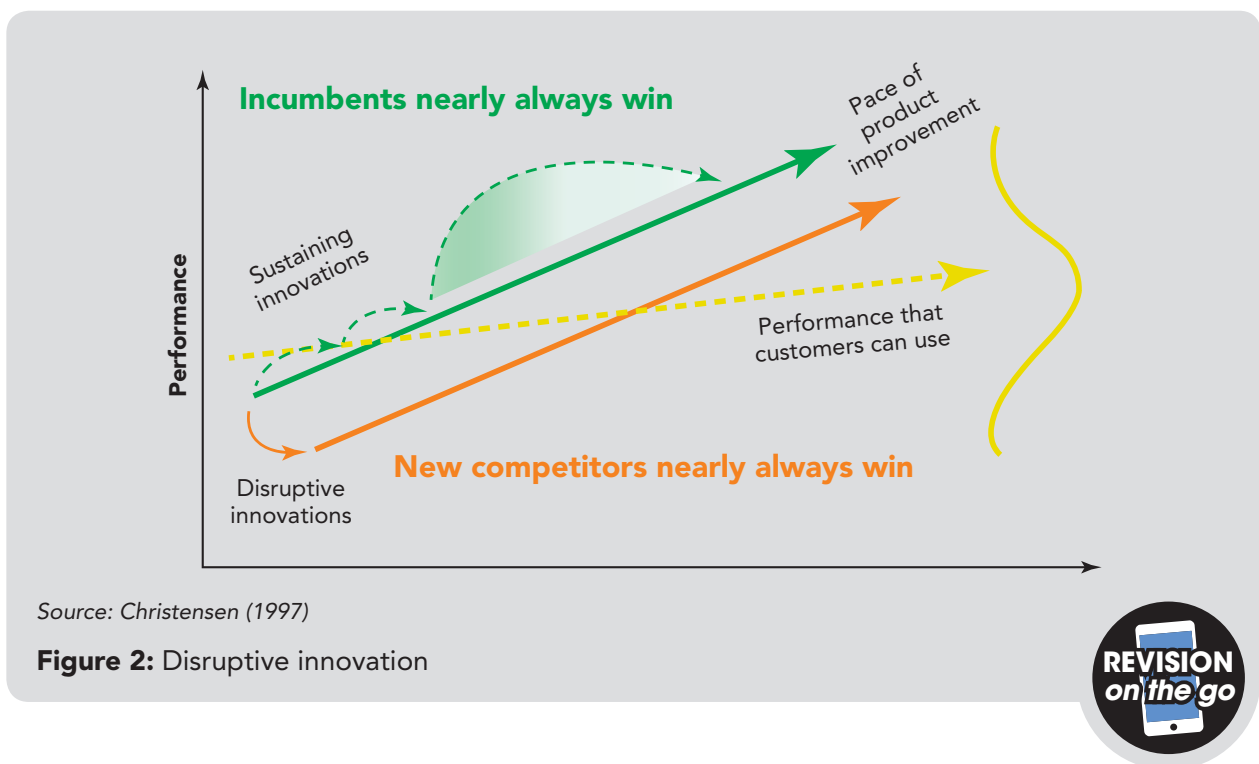
In his book *The Innovator's Dilemma*, Clayton Christensen (2011)⁸ explains the two key concerns regarding innovation, which are:

- 1 The value (or rewards) for an innovation form an S-curve in which the innovation takes time and money to develop, but the impact and rewards cease to return gains at the end of its cycle. Therefore, the most gain is at the middle point of the cycle.
- 2 The dominant organisation has a large customer base, but with this comes an expectation of high sales. This means the **risk** of failure is seen as high in dominant organisations even though they hold market share. New entrants who are innovating will find niches and are more likely to innovate their product to achieve increased sales in these niche areas. This is how small organisations grow and become market **disruptors**, which is where the danger for larger organisations arises.

What does this mean?

- Current customers want innovation on current products.
- Because of the time lag, the next generation product is not satisfying current customers.
- Smaller entrants are focusing on niche innovations and often add value to the product.
- Therefore, because of the time taken to develop and implement innovation, by the time the new product becomes interesting to current customers, it is too late for the dominant organisation to react (due to its position on the S-curve). Commonly, these innovations developed by the dominant organisation may be too sophisticated or expensive for many customers in their market.
- However, they have opened the door to innovations at the bottom of the market. The new entrant has gained market share from the dominant organisation.

Clayton's earlier edition, *The Innovator's Dilemma: When new technologies cause great organisations to fail* (1997)⁹, was named by *The Economist* as one of the six most important books about business ever written. It covers the details of his theories on the S-curve and disruption.



8 Christensen, C. (2011), *The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business*, Harper Business, p. 336

9 Christensen, C. M. (1997), *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Boston, MA: Harvard Business School Press

 OVER TO YOU

Activity 2: Disruptive innovation

**When can 3D printing technology be classed as disruptive innovation?
Give your reasons and state applications for this technology in local industries.**

 CASE STUDY

Dealing with disruptive innovation

Brian Leavy has investigated solutions to the issues that disruptive innovation can cause. Read his article:

Brian Levy (2004), "Practicing disruptive innovation: The Innovator's Solution", *Journal of Fashion Marketing and Management: An International Journal*, Vol. 8 Issue: 4, pp. 452–454 (This article will be available in your online student resources.)

This looks at disruptive innovation and gives some helpful insight into how it is applied.



What does this mean for a business?

By understanding "the innovator's dilemma" and the need for speed and focus to adopt innovation, businesses can use this approach to innovate in niche areas that quickly achieve results. Christensen described this as **disruptive innovation**. This is where the product or service develops in simple or niche markets and grows until it displaces stable competitors.

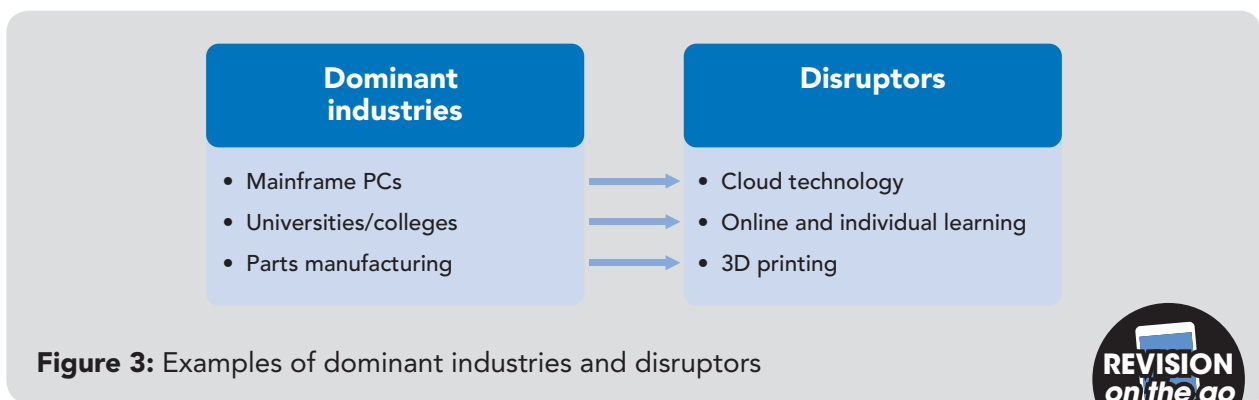


Figure 3: Examples of dominant industries and disruptors



The article by Boer et al. (2001), "Knowledge and continuous innovation: The CIMA methodology" from the *International Journal of Operations & Production Management*, Vol. 21 Issue: 4, pp. 490–504, provides a good summary of knowledge management. (This article will be available in your online student resources.)

Trends in innovation – The Global Innovation Index

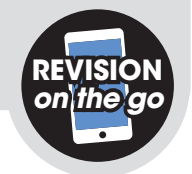
Whilst it is possible to see innovation developing, and in some cases accelerating, in sectors of the economy, one way of measuring the growth of innovation for a country is through the **Global Innovation Index (GII)**.

This is an annual ranking of countries for both their capacity for and success in innovation, and it is published by Cornell University, New York, in collaboration with the French Institut Européen d'Administration des Affaires (INSEAD) and **the World Intellectual Property Organization** (an agency of the UN) among others. In 2017 and 2016, The Global Innovation Index rankings were as follows:

Rank	2017	2016
1	Switzerland	Switzerland
2	Sweden	Sweden
3	Netherlands	United Kingdom
4	USA	USA
5	United Kingdom	Finland
6	Denmark	Singapore
7	Singapore	Ireland
8	Finland	Denmark
9	Germany	Netherlands
10	Ireland	Germany

Source: www.globalinnovationindex.org

Table 1: The Global Innovation Index (GII)



OVER TO YOU

Activity 3: Global Innovation Index

Look at your country and those nearby. What are their relative positions in the latest Global Innovation Index? Has it changed over the past five years? What do you think are the reasons for this change?



Main features of global innovation

Using innovation to support local economic growth

The “exporting” of innovation through offshoring and the **globalisation** of industries is resulting in less dominant countries building up expertise and benefiting from innovation that usually took place in larger, more economically developed countries.

In 2017, the GII showed the growing importance of innovation in African countries and India with their ranking continuing to rise.

In these countries, innovation is stimulated by local governments with incentives such as tax advantages which attract foreign investment. This is followed by a growing internal demand to innovate products. This, together with the impact of foreign investment, results in accelerated local development.

While the issue of enforcing patents and copyrights abroad, as well as intellectual property protection issues still exist in some countries, the wealth associated with growing innovation forms a significant encouragement to support innovation around the world.

Overcoming national division and developing a global mindset

The development of partnerships and **open innovation** (discussed later in this chapter) is difficult and this is magnified when attempting cross-border partnerships.

The best way to overcome these issues is to implement joint ventures between international companies, as companies can benefit from working together and skills can be transferred to foreign divisions.

“Offshoring innovation” is a term used to describe the purposeful innovation programmes set up abroad to benefit from tax advantages and competitive labour rates and skills. Global innovation systems encourage the “export” of innovation and will support all parties involved in sharing and receiving support with innovation.

A common issue in both local and global innovation is that output cannot be guaranteed by spending alone, and the costs of offshoring innovation can make ventures seem riskier, especially if there is a risk that intellectual property (IP) infringements will occur. Local governments need to support and encourage innovation in order to reap the benefits, knowledge and development that these activities bring.

The GII continues to show a momentum building across the world, especially in sub-Saharan Africa, Latin America and the Caribbean and the support of the GII highlights the benefits for these economies and encourages others to develop.

CASE STUDY

Japanese innovation processes

Masaharu Ota, Yohsuke Hazama and Danny Samson have presented some case study data on the topic of innovation in Japan. Read their article, which discusses how Japanese innovation processes can be applied in other businesses:

Masaharu Ota, Yohsuke Hazama and Danny Samson (2013)
 “Japanese innovation processes”, from the *International Journal of Operations & Production Management*, Vol. 33 Issue: 3, pp. 275–295
 (This article will be available in your online student resources.)



OVER TO YOU

Activity 4: Maintaining the GII position

Using the 2017 report, investigate the reasons behind the top four ranked countries (Switzerland, Sweden, Netherlands and the USA) achieving their ranking in the GII.

What can your country do to increase or maintain its ranking?

2.2 Theories and models of innovation

Schumpeter's theory of innovation

Schumpeter's 1942 book *Capitalism, Socialism and Democracy*¹⁰ was influential in shaping early ideas on the subject of disruptive innovation.

He introduced the concept of “creative destruction”, which leads to “industrial mutation” (which could be seen nowadays as innovation); this is the destruction of older, dominant businesses and the renewal of industries.

The theory focuses on the dynamics of business rather than market equilibrium, which forms the basis of many traditional business theories.

¹⁰ Schumpeter, J. A. (2014), *Capitalism, Socialism and Democracy*, NY: Harper & Brothers

Schumpeter's ideas are interesting as they integrate the concept of entrepreneurship and changes in technology into the **business model** of innovation, claiming that their introduction creates disequilibrium in markets.

The imbalance caused by the introduction of innovation creates opportunities for new ideas and processes, which encourages more innovation. This, therefore, has a similar "disruptive" effect to Clayton Christensen's S-curve (discussed in Chapter 2, Section 2.1).

According to Schumpeter, businesses that do not take advantage of available innovations are "destroyed" by the "creative disruption" of the new businesses.

An example of creative destruction would be the development of virtual companies such as Amazon that has revolutionised both the business model for sales but also the process in which the product is delivered to customers.



OVER TO YOU

Activity 5: Disruptors

List four companies from your region or home country that could be described as disruptors, and explain why.

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2

3

4

Innovation through recent years

Five generations of innovation models

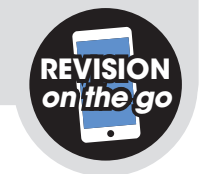
The Handbook of Industrial Innovation by Dodgson and Rothwell (1994)¹¹ summarised the process and development of innovation over the past 50 years. In the table below, the development shows a progression from linear models to integrated systems of innovation. It shows the rapid development of business innovation and describes an interesting parallel with the growth of globalisation.

¹¹ Dodgson, M. and Rothwell, R. (1994), *The Handbook of Industrial Innovation*, Cheltenham: Edward Elgar Publishing

Generation	Time period	Description	Summary
First	50s–60s	Technology-push model	Research and development (R&D) drove post-war innovation with the introduction of synthetic materials.
Second	60s–early 70s	Market-pull model	As competition for market share increased, the importance of customer choice in product selection grew, making marketing a significant force.
Third	70s–early 80s	Coupling model	Growing competitive pressure led to a greater focus on cost-benefit, which meant the technology push was coupled with the market pull and innovation interacted with all areas of the business.
Fourth	80s–mid 90s	Integrated, parallel model	Influenced by Japanese models of innovation, an increase in control and the elimination of waste became the drivers of innovation
Fifth	Late 90s	Integrated, network model	This state builds on the fourth generation and includes greater business network integration and internal and external communication.

Source: Rothwell (1994)

Table 2: Five generations of innovation models



OVER TO YOU

Activity 6: The innovation timeline

What do you think the next stage in the innovation timeline will be?

Continue from the late 1990s until 2030 in the table below.

Generation	Time period	Description	Summary
Sixth			
Seventh			
Eighth			

Generation	Time period	Description	Summary
Ninth			
Tenth			

Open source innovation

The dominant figure in the field of open source innovation is Henry Chesbrough. In Chesbrough's (2003) book *Open Innovation: The New Imperative for creating and Profiting from Technology*¹², he describes how the aim of open source innovation, or open innovation, is to distribute knowledge between industries and countries.

Companies cannot always afford to complete all their own research; open innovation allows them to buy or sell ideas, or to collaborate with other companies. Similarly, innovations developed within a company which are not being exploited can be used by other institutions. This results in an acceleration of innovation and a sharing of both the risks and rewards involved.

Many may see open source innovation as impractical in the business world due to the need for companies to stay competitive rather than cooperative, and it is not always welcomed by shareholders, but there have been many successes attributed to open source innovation.

A well-known result of open source innovation is Linux – the most widely collaborative **project** to develop an operating system. Linux is seen as a communal product with programmers constantly adding new code to enhance the system.

OVER TO YOU

Activity 7: Researching open innovation

Research Linux and an organisation from your region which uses open innovation. Why did they choose open innovation and how has it benefited (or not benefited) the organisation?

¹² Chesbrough, H. W. (2003), *Open Innovation: The New Imperative for creating and Profiting from Technology*, Harvard Business School Press

Directions of open innovation – inbound and outbound

There are two different types of open innovation: inbound (also known as outside-in) and outbound (also known as inside-out).

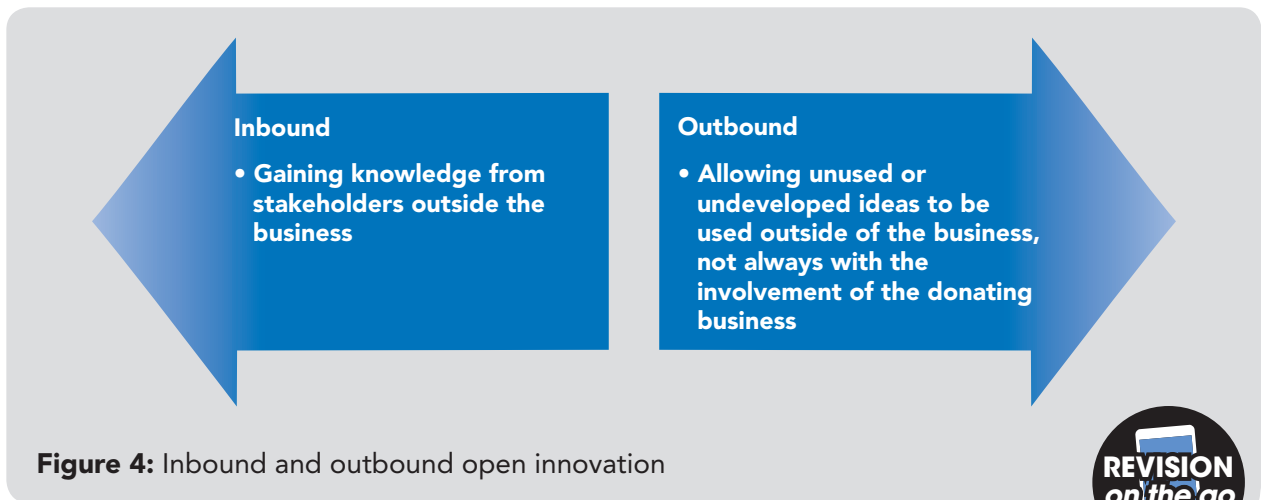
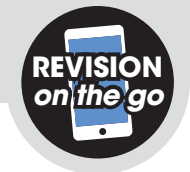


Figure 4: Inbound and outbound open innovation



Open innovation	Methods
Inbound (outside-in)	<ul style="list-style-type: none"> • Competitions • Licencing from other organisations • Purchasing underdeveloped innovations from other organisations
Outbound (inside-out)	<ul style="list-style-type: none"> • Licencing intellectual property (IP) to others • Providing IP at no cost • Forming joint ventures • Developing incubator businesses

Table 3: Inbound and outbound open innovation¹³



CASE STUDY

Open innovation in the pharmaceutical sector

Allan Ya-Huan Wu, Victoria Janine Little and Brian Low investigated open innovation in the pharmaceutical sector. They presented their findings in their study:



¹³ Chesbrough, H., Vanhaverbeke, W. and West, J. (2004), *New Frontiers in Open Innovation*, Oxford University Press, pp. 3–28.

Allan Ya-Huan Wu, Victoria Janine Little and Brian Low (2016), "Inbound open innovation for pharmaceutical markets: a case study of an anti-diabetic drug in-licensing decision", *Journal of Business & Industrial Marketing*, Vol. 31 Issue: 2, pp. 205–218 (This article will be available in your online student resources.)

Read this article to learn more about open innovation in practice.

Drivers of innovation

There are key success factors which are external to the innovation process itself and can be controlled with good management. They are:

- **Motivation of leaders:** Innovation, whether open or closed, can only be successful if the leaders of an organisation are fully supportive of it in both words and deeds so all can see it has the backing of the senior team, even when results are not as hoped.
- **Willingness to disclose:** If an organisation is going to take part in open innovation then there needs to be a willingness to disclose and share information in order to form mutually beneficial working relationships with other organisations.
- **Support of stakeholders:** The innovation process is risky and sharing information with potential competitors may be a significant step for shareholders. It is up to leaders to convince stakeholders that the direction is the best for the organisation and/or society.
- **Skills mobility:** Highly skilled staff often move to where innovative opportunities are present, whether in the existing business or moving to competitors. Therefore, innovation projects can be a way of attracting top talent either to join an organisation or remain in post as part of a staff retention strategy where the high performing employees are given the opportunity to work in these high-profile teams.
- **Availability of external capital:** There may be a need for significant investment, and without this, an innovation may not progress through the innovation value chain (see Chapter 3, Section 3.1). External capital may be required to fund resources, equipment and IP licences.
- **Intellectual property (IP), knowledge and availability:** This is a difficult process to navigate. Applying for IP protection is expensive and time consuming (see Chapter 4, Section 4.3). It is also useful to have knowledge of existing IP so that an infringement is not accidentally made.

Open innovation and closed innovation

With closed innovation, all processes are managed within the innovating organisation and they have complete control. With open innovation, there can be many IP concerns, problems with risk sharing and revenue allocation.

Whilst seen as an open and collaborative organisation, the development of Apple's key products was the result of closed innovation – closely guarded secret development until the products were ready for launch.

Some organisations follow a hybrid model, with initial closed innovation followed by open and collaborative work, but problems still occur here too.

Advantages of open innovation

Some advantages of open innovation are:

- research and development (R&D) can be leveraged by pooling resources;
- an increase in the use of ideas and technology;
- the risks are reduced as the innovation has been developed in part or wholly already;
- employee knowledge is expanded as forming professional connections with similar organisations can develop staff skills and lead to a greater chance of idea generation.

Characteristics of closed innovation

Chesbrough (2003) describes closed innovation as the traditional R&D which was formerly common in most organisations.

He stated that for this to be successful, to undertake closed innovation an organisation must:

- hire the best people in the industry;
- develop all products internally;
- be the first to market;
- lead with investment, as you are likely to discover the most and dominate the market;
- control IP.

For smaller organisations, it seems impractical and too costly to conduct closed innovation. With robust agreements, these organisations can benefit from open innovation.

CASE STUDY

Open innovation in Hong Kong

Yan Xu and Chun Yu Calvin investigated the implementation of open innovation in the technology market in Hong Kong. Read their article:

Yan Xu and Chun Yu Calvin (2013), "Strengths and weaknesses of Hong Kong's technology and innovation industry with reference to the extended open innovation model", *Journal of Science and Technology Policy in China*, Vol. 4 Issue: 3, pp. 180–194 (This article will be available in your online student resources.)



This article will help you to learn about the effects of open innovation within this constantly evolving industry.

OVER TO YOU

Activity 8: Open and closed innovation

Using online research, identify five examples of innovative products or processes that have been developed by either open or closed innovation.

1

2

3

4

5

Diffusion of innovation

Diffusion of innovation is the process by which new products and services spread among people. Usually, when new products or ideas enter the marketplace, only a small group of people adopt them initially; later, if their popularity grows, they may spread to other people.

The main theory in the field of the diffusion of innovation was put forward by Everett M. Rogers (1962, 2003)¹⁴ and explains how and why an innovation is adopted by users and purchasers. There are two key factors:

- 1 Human capital – i.e. as more people adopt the innovation, the larger group begins to demand the innovation.
- 2 Critical mass – to self-sustain, the innovation must hit a critical mass of adopters.

If the point of critical mass has not been reached quickly enough then the innovation will be surpassed by other new goods or services. There are many examples where products may be excellent but they have not reached the critical mass. Though an innovation may be seen (to the producers) as world class, unless it is adopted it will die in the market.



OVER TO YOU

Activity 9: Zune

Despite the backing of the extremely successful owners, Microsoft, Zune failed to be taken up by the market, even though many users found it to be superior to the iPod.

Research this product and assess why Zune failed.

¹⁴ Rogers, E. M. (2003), *Diffusion of Innovations*, 5th Edition, Simon and Schuster

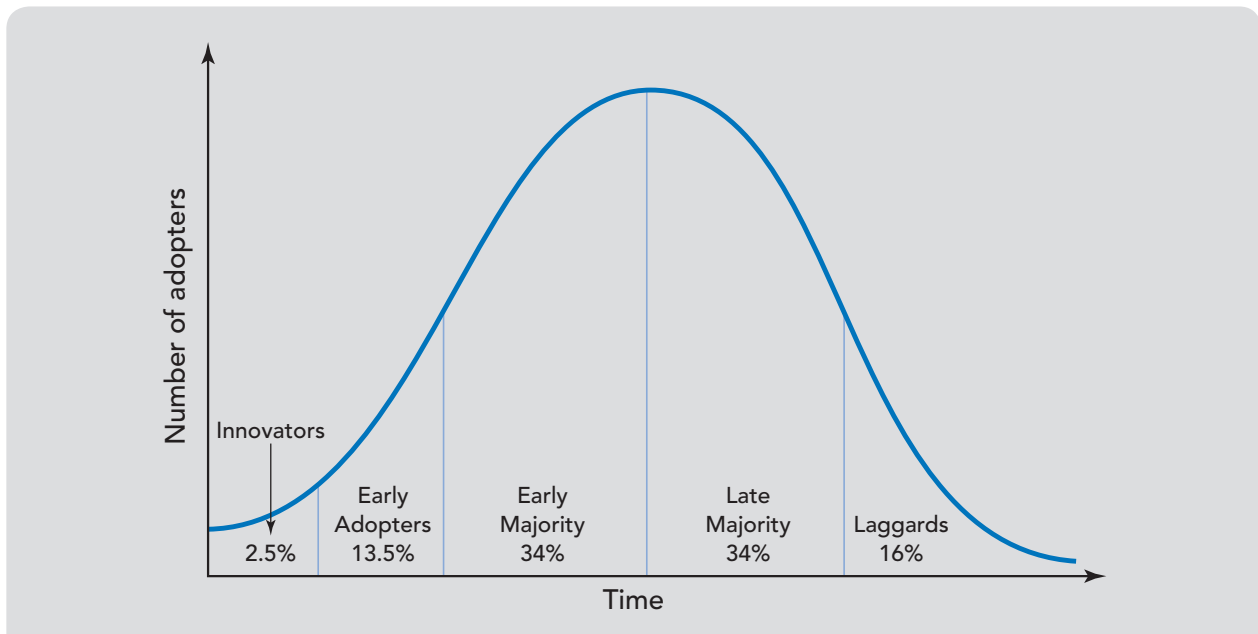
For the diffusion of innovation, the human capital factor (those demanding the goods) is split into four categories:

Category	Details
Early adopters	High levels of opinion leadership with higher social and financial status.
Early majority	These do not hold opinion leadership and adopt an innovation once they are secure enough that early adopters are involved.
Late majority	These are the average adopters; they may be sceptical about the innovation.
Laggards	These adopters have an aversion to change and focus on traditional products and processes.

Table 4: The human factor of diffusion



To hit critical mass for the uptake of the product, the innovators must be selling goods and moving sales into the late majority phase. For a business investing in innovation, the aim is to move into early majority as fast as possible in order to hit critical mass before others do. At this point, innovators can start to recoup investment but the key is to become the market leader as fast as possible.



Source: Rogers (2003)

Figure 5: The distribution of adopters



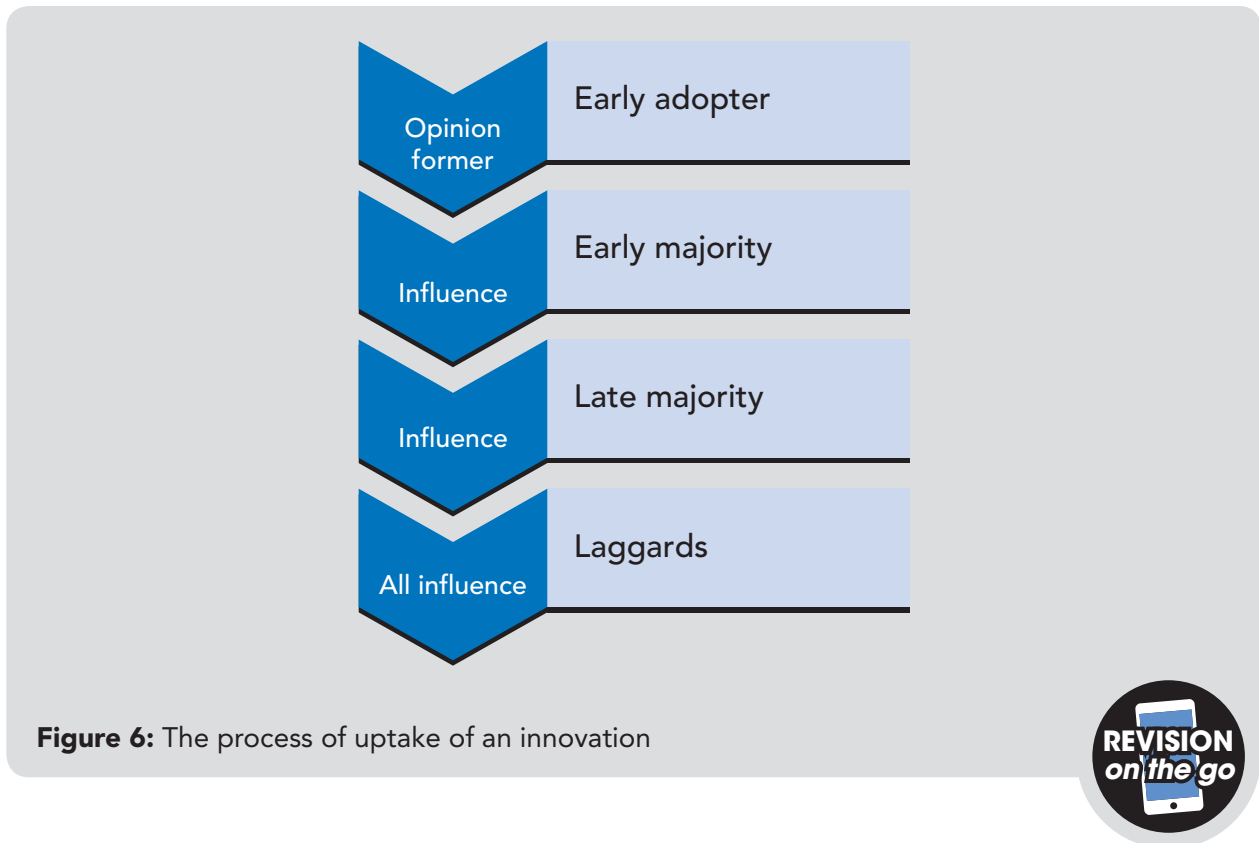
For the innovation of products, it is important for a business to engage more and more adopters and at a rapid rate. The early majority will only come on board if they have seen the opinion leaders showing interest. Similarly, late adopters are convinced by the early adopters. Therefore, the link between innovation and commercial business practice (i.e. the marketing and selling of the goods) becomes vital as the innovators need the engagement of key groups in order for the

innovation to develop market share. This is achieved through the normal marketing and sales strategies of the innovator.

Therefore, diffusion of innovation can be considered to be a process of communication and marketing of the good or service over time. This is therefore affected by:

- the comparative advantage of the innovator (i.e. a dominant organisation);
- the compatibility with other products;
- the ease of use and application.

Therefore, the process of uptake of an innovation becomes:



OVER TO YOU

Activity 10: Are you an early adopter?

For purchases of technology, which of the four categories listed best describes you? Explain why, and give examples of purchases you have made in each category.

Early adopter

Early majority

Late majority

Laggard

How do consumers choose to buy an innovative product?

There are five stages involved in the consumer decision-making process regarding new innovations in the market:

- 1 Knowledge
- 2 Persuasion
- 3 Decision
- 4 Implementation
- 5 Confirmation

The five-stage process of consumer decision-making

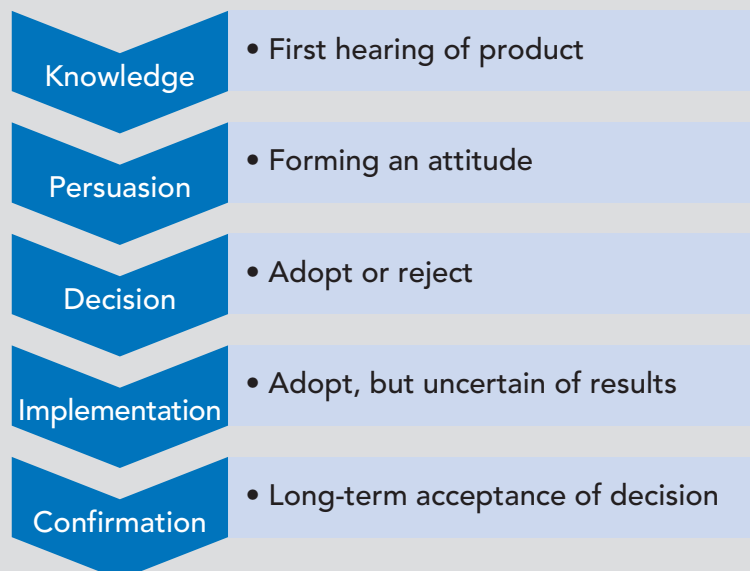


Figure 7: Five-stage process of decision-making



This five-stage process links well with the four categories of adopters above. Early adopters are risk averse so will quickly decide to accept or reject an innovation. The opinions of the early adopters influence the early and later majorities, so they have a significant influence on the decision-making process and success (or failure) of the innovation overall.



OVER TO YOU

Activity 11: Unsuccessful innovations

There are many innovations that do not make it to market and some which do not pass the early adoption phase. Research and discuss three innovations that have not been successful for global organisations and businesses local to your area.

Include why you believe the innovations were not successful.

1

2

3

2.3 Phases in the innovation life cycle of a typical product or service

The innovation life cycle

The characteristics of the innovation life cycle are defined by Abernathy and Utterback¹⁵. They state that the cycle has three phases: fluid, transitional and specific.

¹⁵ Abernathy, W.J. and Utterback, J.M., (1978), "Patterns of Innovation in Technology", *Technology Review*, Vol. 80 Issue 7, pp. 40–47

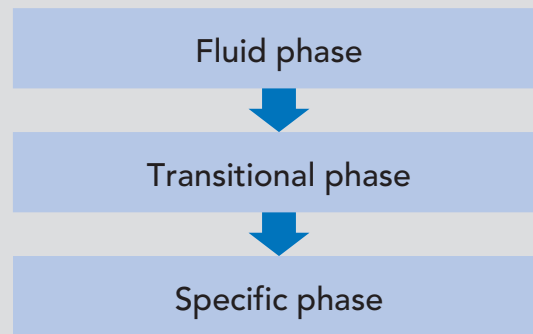


Figure 8: The three phases of the innovation life cycle

REVISION
on the go

Fluid phase

This is where there is rapid concept development with low volumes of product uptake and uncertainty within the market. Early adopters are buying the product/service, but it will not have moved to the early majority phase. Competition is not strong as there is so much uncertainty regarding potential applications and future innovation with the current technology. There are two options at this stage, as shown in Figure 9.

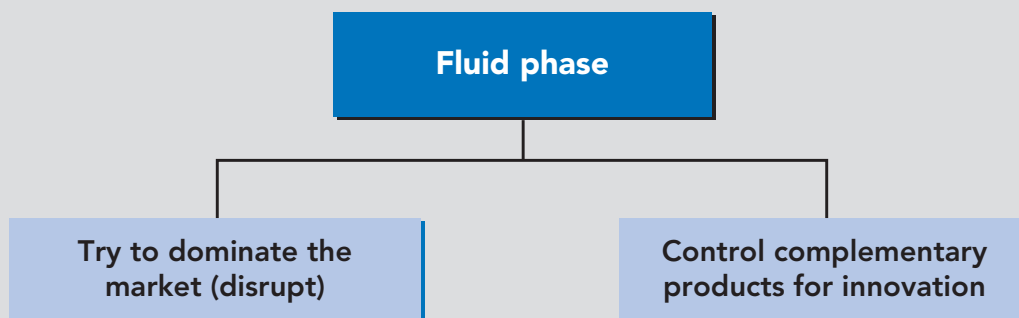


Figure 9: Fluid phase of the innovation life cycle

REVISION
on the go

Complementary products

Not all companies can or want to compete in the innovation race. This may be because of cost factors, intellectual property restrictions, a lack of staff or risk aversion. The innovative opportunity arises in the application of **complementary products**. By scanning the environment and targeting niche innovations, a company can grow in parallel with the growth of an innovation.

A complementary good usually has little or no value on its own, and needs a second (main) good or service to be of value. When demand for one good increases, so will the demand for complementary goods.

For example, with the growth in smartphones, there has been an increase in demand for complementary products (i.e. accessories).

The complementary goods for a smart phone include:

- apps
- screen covers
- cases
- car and wall chargers
- plug adaptors.

Therefore, opportunities arise in the market of complementary goods and an organisation may choose this route to compete in the marketplace.



OVER TO YOU

Activity 12: Complementary products

Chose three innovations and list the complementary products for them. Are there any companies that dominate the market for these complementary products?

1

2

3

Transitional phase

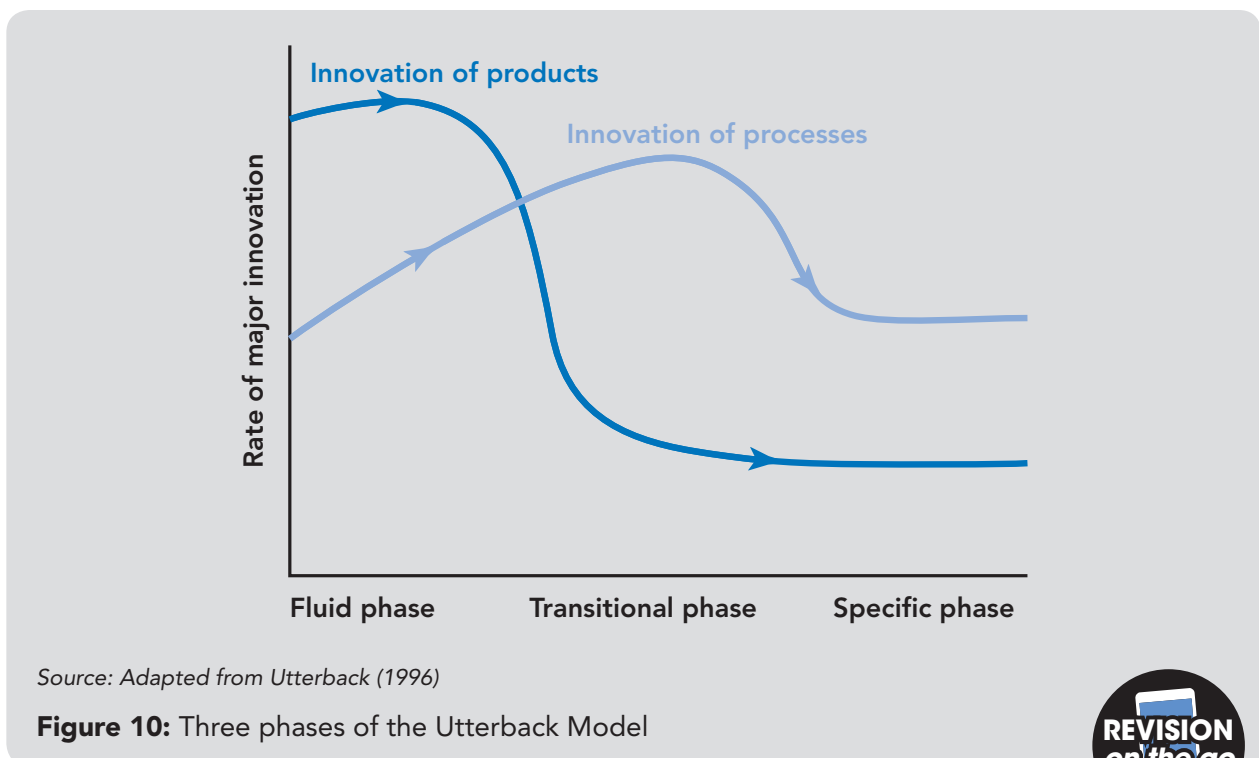
As customers gain more knowledge of and familiarity with the product, it moves from early majority to late majority.

A dominant product will emerge and competitors will need to follow this in order to gain any share of the market. At this stage, organisations will use strategies to hold onto their dominant position and start to prepare the next phase of innovation elsewhere; this means that focused development of this product will diminish.

Specific phase

In this phase, a dominant product or process has been established, and the focus will be on performance and cost, using either production innovation or building a strong relationship with suppliers and customers. The products are now in a fully competitive market with products becoming standardised, with common features and prices. Dominant organisations will now be ready for the next innovation; this is referred to as **dominant design**.

The cycle repeats with the next innovation.



The dominant design emerges where both lines cross and is then developed and innovated for further market growth.

Examples of dominant designs

From the fluid phase where many commercial products aim to achieve dominance, the front runner emerges to become the dominant design. Two examples are:

- **VHS and Betamax videos** – This is a commonly cited battle where VHS videos eventually become the dominant player in the video-player market.
- **Computer operating systems** – The main competitors are MacOS and OS/2 but Microsoft Windows has become the industry standard. In its specific phase, incremental improvements are made to this dominant design in order to update and improve it.

📄 CASE STUDY

Betamax vs VHS

Despite having a head start in the market, Sony's Betamax videotape system was soon overtaken by the Video Home System (VHS) developed by Japanese competitor JVC.

As the VHS product was developed and improved, it soon overtook Betamax and became the dominant model within video recording.

The sale of video recorders and cassettes formed a bait and hook business model – to play VHS tapes, you needed the VHS machine, and to record content, you needed to buy blank VHS cassettes. Therefore, the dominance of one system had a significant effect on the overall sales.



✎ OVER TO YOU

Activity 13: The innovation life cycles for Betamax and VHS

Review available information on this well-known business case. Can you see the innovation life cycle at work here?

Describe the stages and the reason why VHS achieved market dominance.

What happened to both models?

2.4 The different adoption patterns of innovation

Within the world of innovation there are many terms that are used. It is important to understand how each is applied. There is a significant overlap in some definitions of innovation. For example, a new process may be both radical and disruptive.

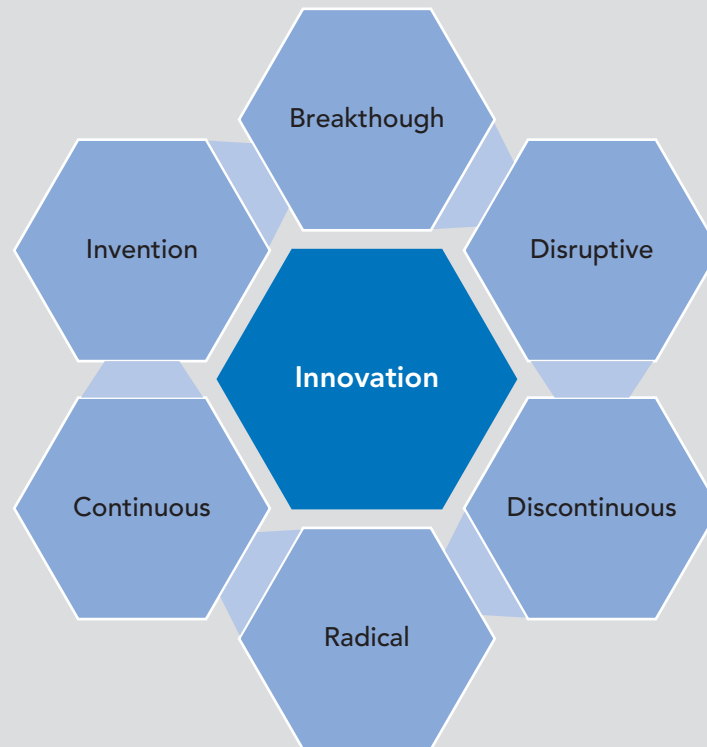


Figure 11: Types of innovation



- **Disruptive innovation** – This describes a new product that enters at the low end of the market and gradually moves up-market, displacing the dominant, stable organisation.
- **Invention** – This is the creation of a new idea or method.
- **Radical innovation** – This is a major change, such as a technological breakthrough.
- **Continuous innovation** – This is the steady enhancement of an existing service or product over time.
- **Discontinuous innovation** – This is where a new technology is applied to an existing product to make something different and new.
- **Breakthrough innovation** – This is an innovation which uses existing ideas but the solution cannot be compared with anything in the marketplace.

Patterns of innovation

There are two main forms of innovation: incremental (step-by-step) and radical (ground-breaking).

For an innovative business, it is important to consider which of the two paths to take (or whether to take both) as there are benefits and drawbacks for each.

The benefits of gradual improvement are that the slower pace of development spreads the cost over time and therefore lowers the risk associated with changes in the product or process.

Other features, both positive and negative, include:

- The innovative business is less ambitious in terms of expected outcomes.
- There is less potential for financial returns as changes are minor and have less impact on the bottom line.

- Less management and project control are required.
- It is linked with approaches to continuous improvement such as **lean manufacturing**.
- Low growth is expected, and this can lead to the loss of competitive advantage as others overtake the organisation's position in the market.
- It is hard to attribute results to one single improvement if there are numerous changes occurring over a short period.
- KPIs must be very specific to identify which areas are improved upon.

Examples of incremental innovations in the market today can be seen in Figure 12.



OVER TO YOU

Activity 14: Incremental innovation

Name more incremental inventions from your home country. Which organisations are successful in incremental innovation?

CASE STUDY

Everything the same, but nicer

Read the report for Bain and Co., “Everything the same, but nicer”, which can be found in the reading list at the end of this chapter.

In the report, the value of incremental innovation is seen as significant. By improving goods and services through innovative ideas, market share can be gained and ultimately profit can be made.

This report highlights the importance of incremental innovation, which is often overlooked when compared to radical innovation.

Source: Karen Harris, Austin Kim and Andrew Schwede, www.bain.com/publications/articles/everything-the-same-but-nicer.aspx



Discontinuous/disruptive innovation

In Chapter 2, Section 2.2, the issue of “the innovator’s dilemma” highlighted the impact of disruptive innovation.

When a radical innovation transforms business practices, the impact can reach beyond the product marketplace; other sectors of business watch to see the outcome of innovations released to see if these new ideas can be adopted for their products. Examples include the radical innovation of Cloud computing where completely different sectors now use it to innovate their products.

It becomes a risk and decision-making issue when companies review the threats and opportunities of disruptive technologies to assess whether or not they will be affected by or can use the innovation to their advantage. Choose the wrong innovation and the cost can be considerable.

Radical innovations can be followed by an explosion of innovation. There were many innovations that laid the pathway for training organisations such as Udemy or Thinkific. Without earlier changes in innovation, it would not have been possible for these organisations to develop so swiftly.

The earlier innovations include:

- the World Wide Web;
- web cameras;
- learning management systems;
- cloud technology;
- e-commerce for payment systems;
- information management systems and databases;
- MS Office and other programmes to present information;
- Skype for face-to-face training opportunities.

These organisations are “disruptors using disruption” to develop their business.

 OVER TO YOU

Activity 15: Disruptors using disruption

Chose an online innovative industry and list the previous innovations that have made the market possible for them to succeed.

Data storage discs

RFID tags

Movie streaming

Tata Nano (car)

Zynga (gaming platform)

Skype

Figure 13: Examples of disruptive innovation

 **NEED TO KNOW**
Adopting innovation

Research by Utterback (1996) shows us that organisations that have previously been leaders in technology often fail to adopt new methods. It is believed they either:

- choose the wrong technology;
- become overly protective of their technology and do not balance the need for managing new and future innovations.



Further challenges and solutions to adopting innovation

Because of the drawbacks of adopting disruptive and/or radical innovation, often organisations have a “portfolio” approach to innovation with a combination of both smaller step changes and innovations that will have greater impact.

An organisation that innovates in both continuous and disruptive forms is known as an **“ambidextrous” organisation**. These typically have distinct units focusing on the two main forms of innovation. By having this form of organisational structure, they develop a focussed framework that can achieve radical changes and continuous, incremental change simultaneously.

The S-curve (Christensen)

In Chapter 2, Section 2.1, the S-curve showed that disruptive changes in the market can overtake dominant products and services by growing from a niche position and repeating the process to continue innovation within the marketplace.

Apple Inc. moved from iPod to iPhone to iPad by assessing the innovation cycles and used the lessons from past successes to gain market domination.



OVER TO YOU

Activity 16: The iPod, iPhone and iPad

Using a process map, describe the development of the iPod, iPhone and iPad.

As you list its development and progression, decide whether it is radical or incremental innovation and explain why.

What factors made this innovation a success?

2.5 Environmental factors that are relevant to an innovative business undertaking

Drucker (2006) identified “Seven Sources of Opportunity” which provides a good understanding of where ideas can come from.

- 1 **The unexpected** – this might be the unexpected failure of a product or a service or an unexpected event. These cannot be predicted but there is a need to react quickly to them when they do occur.
- 2 **The incongruity** – there is a discrepancy between what is and what ought to be within a marketplace. This produces opportunities for organisations that can spot them.
- 3 **The inadequacy in underlying processes** – this is essentially about improving the process. This might be by improving the benefits of what is currently available or by reducing the costs of manufacture.
- 4 **The change in industry or market structure** – perhaps arising from technology, legislation or other outside events.
- 5 **Demographic changes** – for example, the needs of the ageing population in the world are providing many opportunities for entrepreneurs.
- 6 **Changes in perception, mood and meaning** – changes in the economy, fashion culture, etc. These may be identified through market research which can give an insight into future trends.
- 7 **New knowledge** – this could be scientific or non-scientific knowledge. It might be a new discovery or perhaps an invention that presents opportunities.



OVER TO YOU

Activity 17: Seven sources of opportunity

The table below gives the seven sources of opportunity and an example of an innovation for each. Add an example of your own to each one in the space provided.

Source	Example	Your example
The unexpected	The Post-it by 3M	
The incongruity	Smart Car	
Process needs	Peripheral products for smart phone	
Change in market structure	Online shopping	
Change in demography	Holiday companies for senior citizens	
Changes in perception	Organic vegetable	
New knowledge	Vaccines	

Alternative areas of innovation – scanning the external environment

The areas of idea generation for a business may have come from a business need identified during the innovation process. It is also helpful for a business to look at both the internal and external environment to see if there are opportunities for innovation.

The diagram below summarises four further sources of business ideas by scanning the environment they are in, looking at competitors, suppliers and macroeconomic factors.

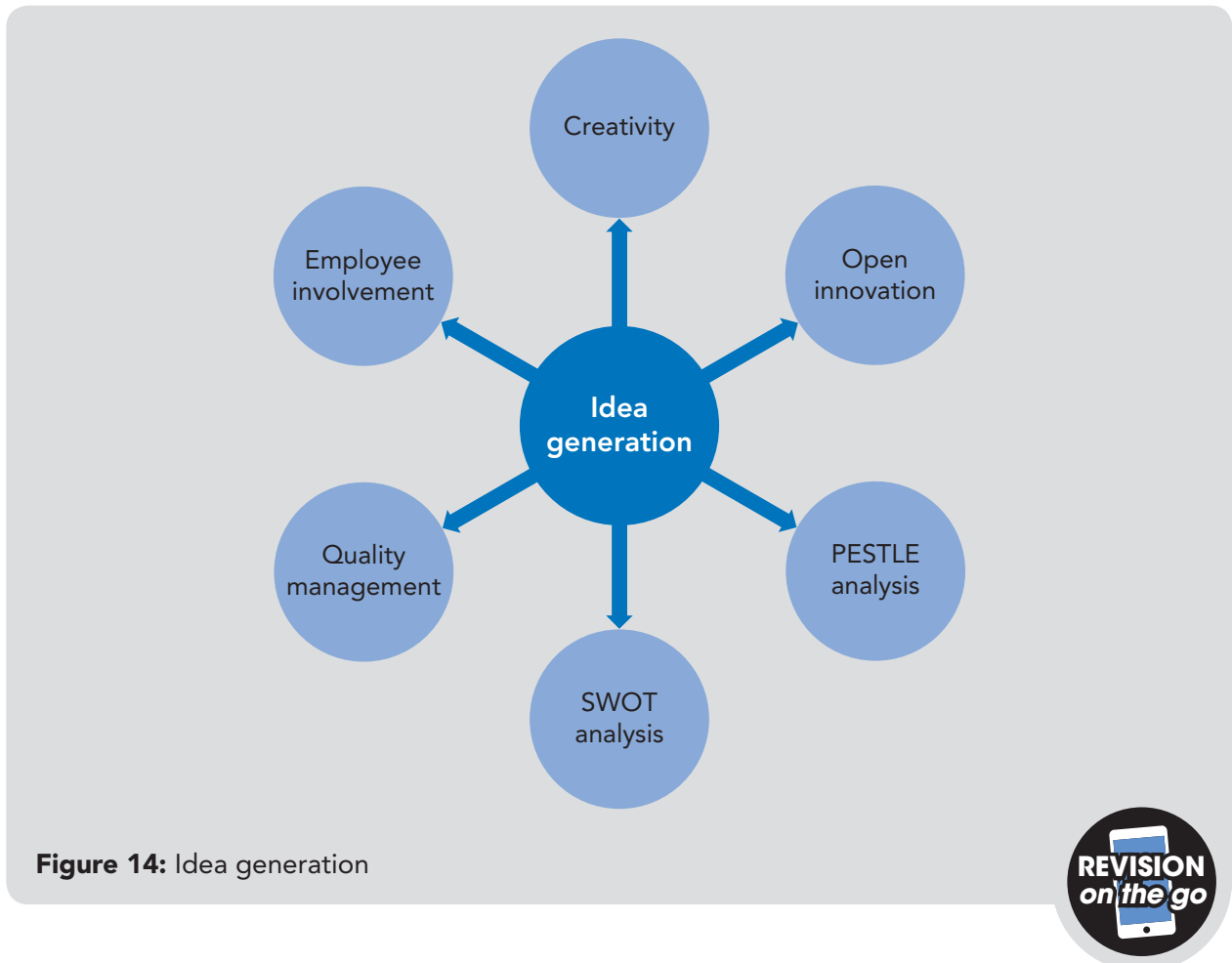


Figure 14: Idea generation



SWOT analysis identifies internal strengths (S) and weaknesses (W) and external opportunities (O) and threats (T). It is a simple and effective method of considering a business proposition and for newly established enterprises, it helps to assess the current position of an organisation.

Examples of areas discussed in a SWOT analysis are shown in Table 5.

Internal factors	Strengths – everything an organisation does well	Weaknesses – issues that place an organisation at a disadvantage
	<ul style="list-style-type: none"> • Product (e.g. first to market) • Channels of distribution • Low cost models • Cost advantage 	<ul style="list-style-type: none"> • Cost of production • Shortage of factors of production • Limited service lines

External factors	Opportunities – reasons an organisation is going to grow	Threats – factors beyond the control of the organisation
	<ul style="list-style-type: none"> • International markets • Innovation • New markets • New channels • Emerging technology 	<ul style="list-style-type: none"> • New competitors • Negative publicity on product • Changing consumer tastes • Emerging technology • Change of government policy

Table 5: SWOT analysis



PESTLE analysis assesses the external (or macroeconomic) forces acting on all markets. This looks at political economic, sociological, technological, legal and environmental impacts on a business.

SWOT and PESTLE can be used to innovate within a business by considering the “What if” principle.

“What if” imports increase in price – can supplies be sourced locally or changed in any way to reduce cost? Innovating in the supply chain is often a result of external influences. By scanning the external environment, planning for innovating goods and services can be initiated. Even though not all innovations complete the process to market, there are always improvements and new markets to address, and analysing internal and external markets will focus attention on where best to focus resources.

External factor	
Political	Change of government and political aims Growing political focus on sector Changes in trading laws and restrictions
Economic	Economic recession Disposable income and unemployment rates Stage of business or innovation lifecycle
Social	Change in demographics Population growth Socio-cultural changes
Technological	Emerging technologies Access to Wi-Fi Technology transfer

External factor	
Legislation	<p>Specific legislation to sector</p> <p>Difficulties trading cross-boarder</p> <p>Increase in employment and business legislation</p>
Environmental	<p>Increasing environmental awareness and impact of regulations</p> <p>Changes in weather patterns and impact of natural disasters</p> <p>Environmental protection</p>

Table 6: PESTLE analysis**OVER TO YOU****Activity 18: SWOT and PESTLE**

An issue can be both a threat and an opportunity to an organisation. Consider how emerging technologies might impact the following four types of business. Provide examples of each.

- 1 A pharmaceutical organisation

- 2 An airline

- 3 A courier services organisation

- 4 A telecommunications organisation

READING LIST

- Boer, H., Caffyn, S., Corso, M., Coughlan, P., Gieskes, J., Magnusson, M., Pavesi, S., Ronchi, S. (2001), "Knowledge and continuous innovation: The CIMA methodology", *International Journal of Operations and Production Management*, Vol. 21 Issue: 4, pp. 490–504. (This article will be available in your online student resources.)
- Harris, K., Kim, A., Schwede, A. (2011), "Everything the same, but nicer" [online]. Available at: www.bain.com/publications/articles/everything-the-same-but-nicer.aspx [Accessed: 2 June 2017]
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- Wu, A. Y. H., Little, V. L., Low, B. (2016), "Inbound open innovation for pharmaceutical markets: a case study of an anti-diabetic drug in-licensing decision", *Journal of Business and Industrial Marketing*, Vol. 31 Issue: 2, pp. 205–218. (This article will be available in your online student resources.)
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Summary

This chapter explored innovation and how it is relevant to a modern business. Theories and models were presented to demonstrate how innovation can impact the success and survival of a business and how businesses successfully adopt innovation.

Case studies were also presented to show why some products have succeeded where others have failed, and the key processes in the adoption of innovation by customers.

However, the problems and cost of innovation cannot be overlooked and given the high failure rate of innovation, consideration must be given to the investment in resources, both physical and human. This chapter examined these issues and how organisations address them, using examples of successes and failures.

Chapter 3

Assessing the Information Requirements

Introduction

This chapter will look at innovation in practice, and how innovation can impact upon the performance of an organisation. Innovation follows a process, with key performance indicators being used to assess the potential for success at each point along the way, from when an idea is first conceived, through the developmental stages, until it is released into the marketplace.

There are many methods to measure the relative success or failure of an innovative idea, product or service; the main methods will be explained and discussed.

Learning outcomes

On completing the chapter, you will be able to:

- 3 Assess the information requirements needed to manage levels of innovation within an organisation**

Assessment criteria

- 3 Assess the information requirements needed to manage levels of innovation within an organisation**
 - 3.1 Appraise the characteristics of an innovative organisation
 - 3.2 Assess the impact of innovation on overall business performance
 - 3.3 Evaluate some of the common methods of measuring the extent and successes of innovation in a business

Level 5 Innovation and Business Performance

3.1 Characteristics of an innovative organisation

The innovation value chain

There are three main stages in the process of innovation within an organisation:

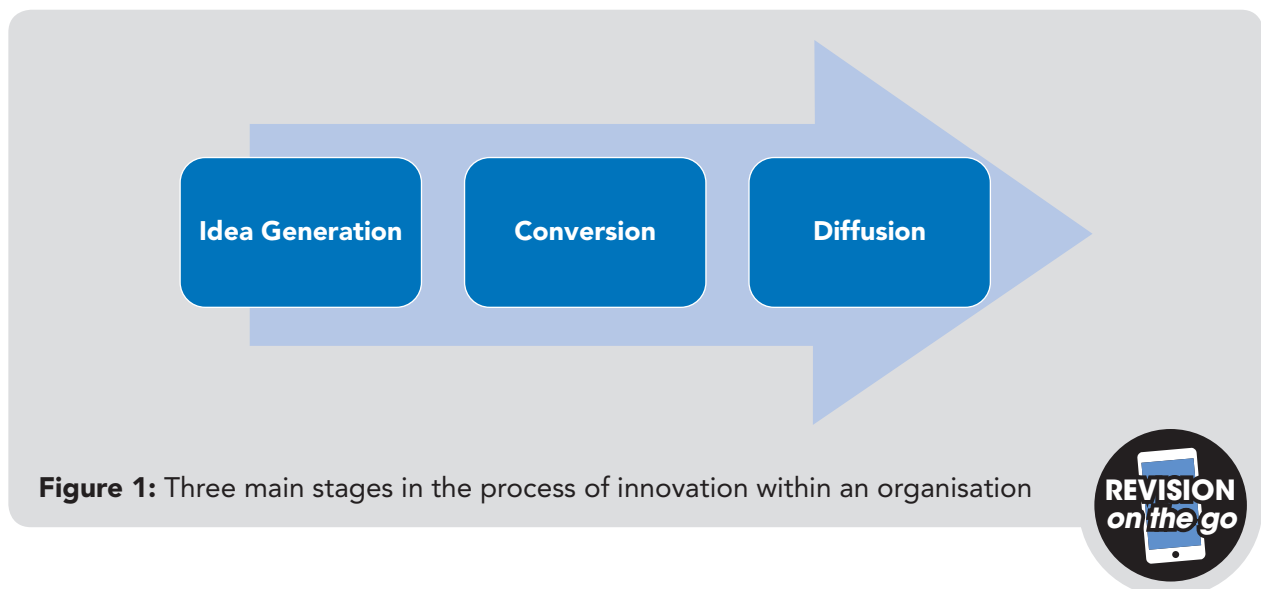


Figure 1: Three main stages in the process of innovation within an organisation

Individuals or small teams often come up with the most insightful ideas within an organisation. By working within teams, the exchange of ideas often generates greater innovations.

These teams could be internal or with partners such as suppliers or within a joint venture.

This is where the structure of an internal communications strategy within an organisation becomes key. Collaboration is much more difficult if business units are separate and not integrated. There needs to be a strong and effective communications link to all areas of an organisation so that innovation is:

- not replicated in other areas as different teams are unaware of other's activities, which can cause a duplication of effort;
- focused;
- in line with the mission and values of the organisation.

There are many examples of organisations being too slow to innovate because they were poorly structured to cope with it.

 OVER TO YOU

Activity 1: Failed innovations

From your research, discuss examples of failed innovations. What were the reasons for the failures, and did the organisations learn from these mistakes in order to recover their losses?

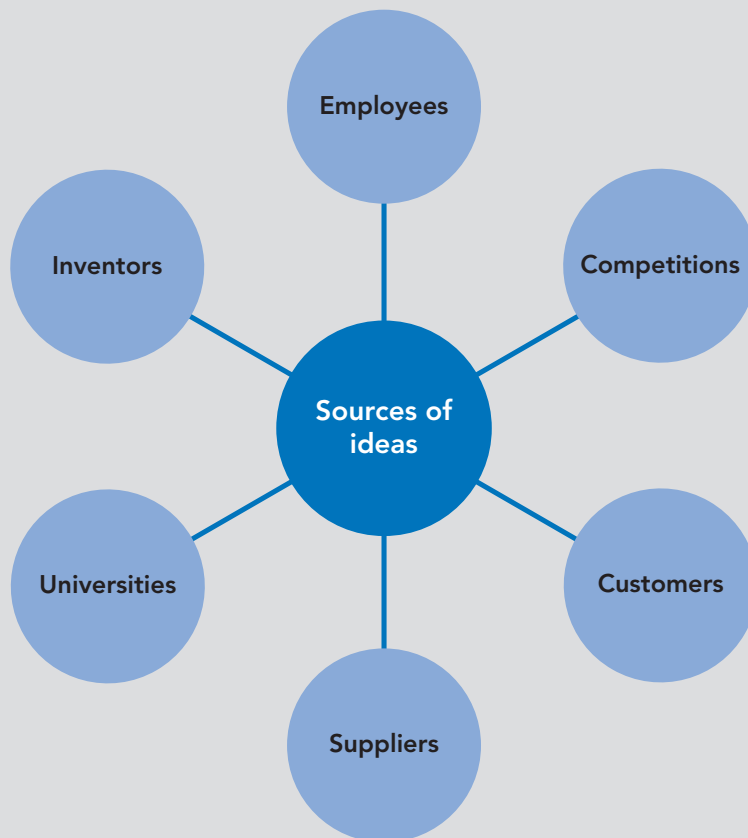


Figure 2: Sources of ideas



Innovation competitions

You may have spotted the circle marked “Competitions” in Figure 2. Many large organisations hold competitions for innovative ideas. These are popular with students and inventors who need financial backing for an idea. Some examples are given below.

- The Electricity Network Innovation Competition – Up to £70m is available each year for innovative ways to develop new technologies within electricity generation.
- Newton Fund – UK-Malaysia Urban Innovation Challenge – for innovative projects around urban mobility, urban waste and urban water management in Malaysia to the value of £3m.

Concerns can arise regarding intellectual property for competitions, as there may be restrictions on who owns the IP for winners, and if an innovation has been rejected but did not have IP protection, it may then be exposed.

Innovators have to weigh up the advantages and disadvantages of competitions. The rewards can be significant and exposure beneficial as others may identify a need for a project that does not necessarily win. However, the risks must also be considered before committing to compete.

CASE STUDY

To encourage innovation, make it a competition



Read this article:

Anil Rathi (2014), “To encourage Innovation, Make It a Competition”, *Harvard Business Review* [online]. Available at: <https://hbr.org/2014/11/to-encourage-innovation-make-it-a-competition>

It is an interesting read on how innovation can be supported and encouraged with internal and external competitions.

Key actions in the innovation chain

There are six linking actions which are performed across these three stages of the innovation chain.

The diagram below shows these six actions which move from idea generation to diffusion and the tasks that are performed. For each task, there are key questions and key performance indicators (KPIs) for the organisation to consider in assessing the success of the process of innovation.

	Generation of ideas			Conversion		Diffusion
	Internal (standalone)	Internal collaboration	External collaboration	Selection	Development	Diffusing internally
Key questions	Can individual staff or teams come up with innovative ideas?	Can different teams and divisions work together to come up with innovative ideas?	Can we draw inspirations from / work with parties outside of the organisation to come up with innovative ideas?	Can we screen new ideas and fund them if they seem to have potential?	Can we move from ideas on paper to physical products / viable services?	Can we diffuse developed ideas and innovations throughout the organisation?
KPIs	How many good ideas can be generated?	How many good ideas can be generated?	How many good ideas can be generated?	What percentage of ideas end up being selected and funded?	What percentage of ideas create revenue, and how many months does that take?	How much do the ideas spread into the desired internal divisions / markets and customer groups, and how long does that take?

Source: Adapted from https://hbr.org/resources/images/article_assets/hbr/0706/R0706J_A.gif

Figure 3: Key actions in the innovation chain



In Chapter 2, Section 2.3, the issues of managing the innovation process highlighted how organisations often have a need for both incremental and disruptive innovation to maintain competitive advantage. The Innovation Value Chain not only demonstrates the steps that an organisation can take, but more importantly, it provides a framework for the measurement of each step.

Read Hansen and Birkinshaw’s article “The Innovation Value Chain” in the *Harvard Business Review* (2007)¹⁶, which is detailed in the reading list at the end of this chapter. This review provides a clear explanation of the three stages of the Innovation Value Chain, together with contemporary examples.

Organisational conditions needed to promote innovation

There are many conditions in an organisation required to foster innovation. The influence of the culture, leaders, structure, policies and business models all have a role to play. Not all of these necessarily need to be in place as innovation can occur in the absence of one of these conditions. However, with a clear organisational focus upon innovation, there is a greater chance of success.

¹⁶ Hansen, M. and Birkinshaw, J. (2007), “The Innovation Value Chain.” *Harvard business review*, Vol. 85, pp. 121–30, 142

Organisational culture

With formal roles, it is hard to encourage teamwork outside of areas of responsibilities, and with a structure that is highly rigid, there is a chance that ideas are not shared and the potential of innovation is not achieved. This can be overcome if there is a sense of **organisational culture** in place.

	Barrier	Methods to overcome
Culture	Competitive teams who are unwilling to work together	Restructuring or cross-functional working
Leadership	Leader does not support change	Sub groups to lead innovation independent of the board
Communication	The hierarchy can affect the communications flow between levels and divisions	Improved structure of communication
Business models	Tall structure with many layers of management	Matrix or flatter structure Competition and intrapreneurship
Policies	Too many steps to change business	Matrix or flatter structure

Table 1: Barriers to innovation and ways to overcome them



Intrapreneurship (Corporate entrepreneurship) and innovation within an organisation are closely linked.

An intrapreneur applies the principles of entrepreneurship, usually by working in a small team, in pursuit of an innovative product or service. The benefits of this approach to innovation are that, although the organisation bears the cost and risk, the different way of working can deliver improvements in performance and lead to the subsequent development of an enterprising culture within the organisation, as ideas and methods from intrapreneurship spread through the organisation.

Organisations can be encouraged to develop an enterprising culture on seeing the success stories of others, such as Gore-Tex™, or when they remove the layers of management to become a flatter structure and realise working in a team can be more efficient.

A good example of intrapreneurship is at Lockheed Martin, where a small team – the Skunk Works project – created new aircraft models for the organisation.

Read Peter Drucker's article "The Discipline of Innovation" in the *Harvard Business Review* (2002), which is detailed in the reading list at the end of this chapter, for an insight into how innovation impacts upon an organisation.

CASE STUDY

3M – A model of innovation

Read Adam Brand's article. It discusses innovation in 3M (an organisation famous for the "unexpected" invention of the Post It) and provides an interesting insight into the working practices in this German organisation.

Adam Brand (1998), "Knowledge Management and Innovation at 3M", *Journal of Knowledge Management*, Vol. 2 Issue: 1, pp. 17–22. (This article will be available in your online student resources.)



Successful adoption of open innovation

Having understood the organisational conditions needed to promote innovation, there are also requirements for encouraging open innovation (OI). Even if an organisation has developed an innovation culture, dealing with external teams in order to share expertise and ideas can be a challenging step. Key requirements include:

- networking and connectivity with potential partners (example of Proctor and Gamble);
- framework for working within open innovation (OI) – setting the rules of the game;
- **core competencies** required for OI (see Chapter 3, Section 3.1);
- resources – cost, network, staff – commitment at the top of the organisation.

CASE STUDY

Pharmaceutical organisations operating OI with competitors and collaborators

Eli Lilly

Eli Lilly developed an Open Innovation Drug Discovery (OIDD) platform. This shares its owned (or proprietary) information with partners who are researching pharmaceuticals. In 2015, it had over 350 institutions working within the programme.

Eli Lilly and Pfizer

These key players in the pharmaceutical industry are working together to develop new pain medications.

Pfizer, Merck, Amgen and Incyte

These companies are collaborating on combining their own drug to produce better solutions to immunotherapy.

These examples show how organisations that invest heavily in R&D and traditionally used the closed form of innovation are changing their approach and working with both competitors and educational establishments in order to innovate and benefit from the advantages of open innovation.



CASE STUDY

University of Cambridge (UK) Institute for Management: How to implement open innovation

Read the report by the Institute for Management, linked below:

www.ifm.eng.cam.ac.uk/Resources/Reports/OI_Report.pdf

This report details lessons from large multinational companies and provides a good insight into different sectors and the problems and benefits of open innovation (OI). Using examples ranging from the pharmaceutical sector to electronics, methodology for OI and lessons learnt provide a good background for students.



Core competencies

Core competencies are the skills and resources that are required for an organisation in order to develop an advantage within a competitive environment. Core competencies enable a business to move into new markets, usually with the confidence that their competitors will find it hard to replicate specialised knowledge.

Prahalad and Hamel (1990)¹⁷ described core competencies as having three key criteria; they should:

- provide access to markets;
- add value to the product for the customer;
- be difficult for competitors to imitate.

Within a business, the product portfolio has to meet the aims of the organisation and drive competitiveness. Success can only be achieved if products add value to the customer but cannot be quickly innovated by competitors.

OVER TO YOU

Activity 2: Core competencies

**How does this model relate to innovation in an organisation you have researched?
Is it better for an organisation to develop its skills or join with the supply chain?
Explain your views.**

¹⁷ Prahalad, C. K., and Hamel, G. (1990), "The core competence of the corporation", *Harvard Business Review*, Vol. 68, Issue 3, pp. 79–91

As with all areas of management, the selection, development and diffusion of the innovation are vital steps that need to be managed well if the innovation is going to meet the targets set.

3.2 The impact of innovation on overall business performance

Overview of the impact

Innovation has a clear and demonstrable effect on the business performance of an organisation. Innovations in the technology world have led to the creation of one of the most profitable companies in the USA – Apple Inc. Innovative companies achieve the core benefits of sales and profit but there are other benefits:

- attracting and engaging high quality staff who can create the next innovation;
- creating productivity improvements which lead to a decrease in costs;
- speedy response to disruptors due to the culture of innovation and qualified staff;
- using innovation to develop an agile organisation that is quick to respond.

Therefore, success creates more success as the organisation learns from innovations and uses this knowledge to develop improved innovation processes and learn from previous programmes.

Organisations that have not benefited from successful innovation can use the experience of others, through benchmarking and hiring experienced staff, to create an innovative culture.

Through teamwork, strong communication links, attending conferences and, on occasion, introducing thinking time, the concept of innovation can soon become embedded into the organisational culture.

Measuring the results of these concepts can be difficult but if the aim is linked to strategic objectives, then KPIs must be put in place (see Chapter 1) in order to ensure the investment in innovation activity is worthwhile.

Employee involvement in innovation

The role of talented staff in innovation is critical and common to all innovation of products and services, whether this is in an R&D team or a teamworking scenario in a continuous improvement process.

In their report¹⁸ the PwC Health Research Institute identified that 59% of pharmaceutical industries find it challenging to recruit and retain talent to innovate. In this sector, as in so many others, organisations offer employees the opportunity to work on innovation-based projects as part of their staff retention strategy. The chance to be part of an innovation team is often seen as a reward for employees.

However, rewarding employees by allowing “thinking sabbaticals” or dabble time (as with WL Gore) in order to think up new concepts and applications means time is spent away from core tasks on ideas that may not bear success.

Therefore, you can see it is a difficult balance. To keep the talented workforce, it is necessary to reward them with participation in innovating products but these may lead to failure, thus draining the organisation of time from the talent pool. However, it is this group of employees who are key to innovation success. It is a challenge that many organisations fail.

¹⁸ PwC Health Research Institute (2013), “*New Chemistry: Getting the biopharmaceutical talent formula right*” [online]. Available at: <http://www.pwc.com/us/en/health-industries/health-research-institute/publications/human-capital-pharma.html> [Accessed on 11/08/2017]

CASE STUDY

WL Gore – It's Dabble Time

The expectation in WL Gore that every employee will spend 10% of time towards new ideas or initiatives has led to significant innovations for the private organisation that makes Gore Tex.

David Myers, an employee in the subsidiary making parts for heart implants, used his "dabble time" to create a coating for the gear cables of his bicycles.

This led to the development of "Ride-on", the brand for their bike cables.

The use of this coating was developed further, with two other colleagues who used it on guitar strings. Eventually this led to the branding of Elixir guitar strings, which have become a significant brand in the guitar string sector.

By allowing employees time to think, accepting failure and backing ideas, this organisation has developed new markets and increased financial performance.

Source: Gary Hamel, "Innovation democracy: WL Gore's original management model" 2013



Accepting failure

As seen throughout this guide, failures are common in the innovation process. If an innovation culture is to be accepted then freedom to fail is also required.

One area is how to accept failure. If an organisation incentivises innovation through the process, then products which are unviable can be developed even when they have little chance of failure. The concept of "**fail early, fail cheaply**" encourages both innovation and the ability to stop as soon as a concern over viability arises, so decisions to cease early will save wasted development costs further on for the organisation.

OVER TO YOU

Activity 3: Rewarding innovation

**What examples of rewarding innovation have you discovered from your research?
Why do you think they have been so successful?**

Performance measurement of innovation

Considering the need to stay competitive and the cost for developing an innovative organisation, the development of measures and indicators is important to assess, both for leaders and employees.

Performance indicators also provide a feedback loop which allows corrective action. These measures can be financial and non-financial.

Chapter 1 detailed performance indicators and measurements in business and this chapter will focus upon measuring the innovation process. This adds to Section 3.1, the innovation value chain, which included performance indicators that can be used at each step.

CASE STUDY

Nespresso – a successful example of innovation

Alexander Brem, Maximilian Maier and Christine Wimschneider looked at how the organisation Nespresso had implanted innovation successfully to gain an advantage over their competitors in the market. Read their article to learn more:

Alexander Brem, Maximilian Maier and Christine Wimschneider (2016), "Competitive advantage through innovation: the case of Nespresso", *European Journal of Innovation Management*, Vol. 19 Issue: 1, pp. 133–148. (This article will be available in your online student resources.)



Measuring what is understood

When measuring the performance of innovation, the first step is to have a clear understanding of which method of innovation has been used. Innovation may be carried out by a small team of corporate entrepreneurs, through open innovation or throughout the organisation as part of a continuous improvement programme. The method affects output, costs and results.

It is unfair to measure the results of a large research and development team against the results of a continuous improvement plan which incurs lower costs and gradual improvements.

After consideration of the type of innovation employed, the next step is to set clear and attributable measures.

Input measures record the resources used throughout the innovation process.

Output measures show the completed activities within the innovation process.

Input measures	Output measures
Staff hours involved in projects	Revenue from specific innovation
Staff training hours	Number of completed actions in process
Number of ideas generated	Number of projects abandoned

Input measures	Output measures
Management time for process	Number of patents
Number of partners involved	Measure of awareness/publicity
Time from start up to diffusion	Market share for specific innovation

Table 2: Input and output measures



Impact of developing innovations on performance

Even if it moves incrementally, a change to an innovation can have a significant impact on financial performance as investments in resources, time and corporate effort will, in the short term, change the focus of the organisation. This is often in the short term until the process becomes embedded.

The management must focus on:

- switching to innovative culture;
- removing barriers to innovation;
- communication and involvement;
- building trust;
- the cost of partnerships;
- lost opportunities;
- sharing resources;
- the risk of a new direction.

3.3 Common methods of measuring the extent and successes of innovation in a business

Post-project reviews in innovation management

In all programmes and projects, a review after the implementation is important. The benefits of a review include:

- recognition for hard work;
- identifying whether goals were met;
- spotting reasons for failure or falling short of targets;
- assessing the resources used;
- looking for improvement opportunities and learning points;
- noting good practice to be carried forward;
- reviewing whether the process itself was efficient or flawed.

Post-project reviews can therefore be of benefit to an organisation but only if there is acceptance of mistakes and honesty. Otherwise, lessons will not be learned and a blame culture will develop.

This is particularly destructive when trying to develop an innovative culture, which is difficult given the chances for success of an innovation cannot be guaranteed.

For assessing improvement opportunities in the innovation process, the standard post-programme reviews may be difficult to use because they are not suited to the small incremental changes often associated with innovation (incremental/continuous innovation).

Therefore, the review must contain a combination of qualitative and quantitative measures to understand the direct impact of each change. This allows scope for individual feedback, which, when combined with a financial assessment, will provide metrics to build a review and learning points for future innovation projects.

Further performance metrics – the NESTA innovation audit

As you saw in Chapter 2, Section 2.1, the Global Innovation Index highlights innovation at a national level. NESTA produced an innovation index to help organisations measure innovation both at an aggregate level and at the organisation level, and includes external engagement and tracking through the stages of innovation.

These are detailed measures which can be used in many organisations and are a useful starting point for developing innovation metrics.



OVER TO YOU

Activity 4: Innovating in telecommunications

What metrics would you choose to measure innovation in a telecommunications organisation?

Choose a second type of organisation and develop your measurements for them.

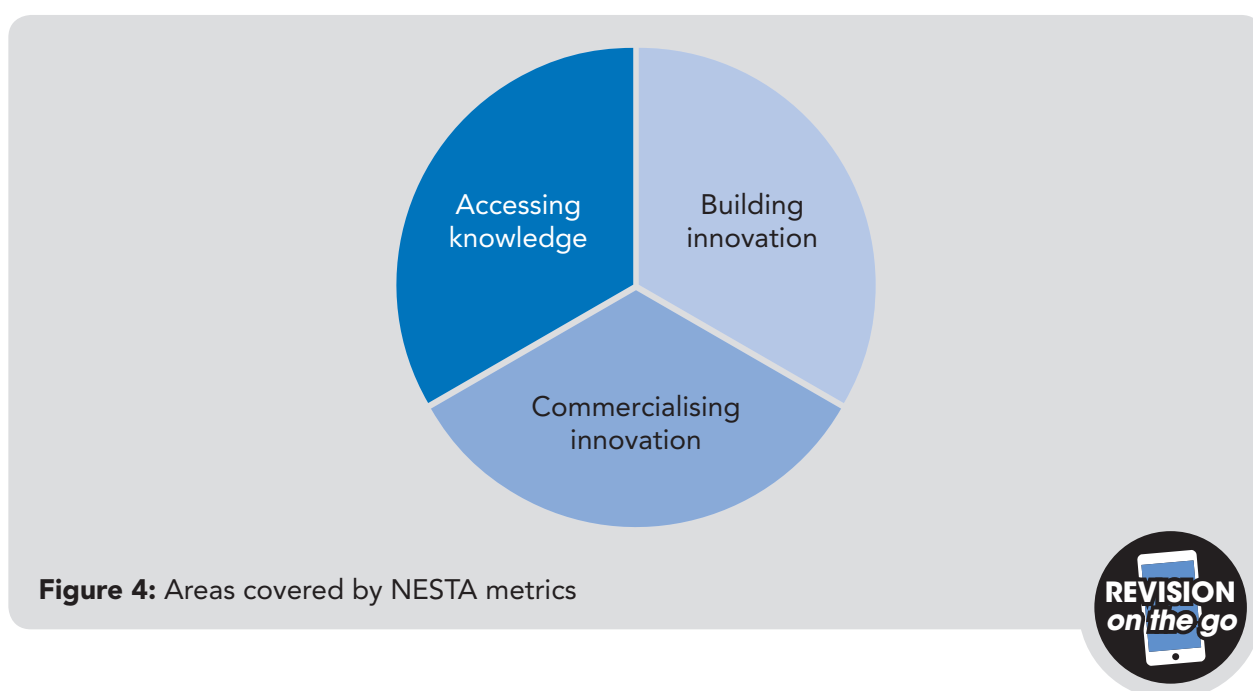
NESTA has produced a report which measures the sectoral innovation capability in nine areas of the UK economy.¹⁹

The report is useful to teams leading innovation as it focuses on innovation capability in nine areas of the UK economy and the metrics suggested are transferable to other organisations.

The sectors are:

- 1 Accountancy
- 2 Architectural services
- 3 Consultancy services
- 4 Legal services
- 5 Software and IT services
- 6 Automotive sector
- 7 Construction
- 8 Energy production
- 9 Specialist design

The metrics cover three areas: accessing knowledge, building innovation and commercialising innovation. These are shown in Figure 4.



There are many metrics covered in the NESTA Innovation Index – key ones for each are highlighted below.

Key Metric 1: Accessing knowledge

A1 – The proportion of externally-sourced ideas

This reflects the openness of an organisation’s knowledge-gathering activities. This is gathered by understanding “the proportion of new products and services typically coming from outside the organisation”.

¹⁹ Roper, S., Hales, C., Bryson J. R., Love, J. (2009), *Measuring sectoral innovation capacity in nine areas of the UK economy*. London: NESTA. Available at: www.nesta.org.uk/sites/default/files/measuring-sectoral-innovation.pdf

A2 – R&D intensity

This is defined as the R&D expenditure as a percentage of sales (turnover) in a year.

*Key Metric 2: Building innovation***B3 – Diversity of innovation activity**

Using a baseline of six different types of activity relating to: product/service, processes, strategy, management systems, organisational change, and marketing innovation.

Using a base value of 100 if an organisation engaged in all six, and 50 for three different forms of innovation.

B5 – Embeddedness of teamwork in building innovation

This reflects the extent of the commitment to teamwork. The five attributes of an organisation's teamworking activity:

- Teamwork plays a major role in the development of new products/services.
- Development teams are cross-functional teams operating independently to solve problems.
- Teams operate independently without interference.
- Organisations invest in training in teamworking.
- Teams often involve customers or suppliers.

Each attribute scored 20%.

*Key Metric 3: Commercialising innovation***C2 – Spending on branding and marketing intensity**

This is the spending on branding and marketing as a percentage of sales (turnover) to assess the commitment to diffusion of the innovation.

C5 – Use of IP protection

Using the six forms of intellectual property protection:

Registration of new designs, trademarks, patents, copyrights, confidentiality agreements, non-disclosure agreements.

As with B3 organisations, using all six forms of IP protection earned 100%.

Using the NESTA Innovation Index

With this data, the Innovation Index has been created for organisations and industry sectors which shows who is innovating and gaps that could be filled.

The Innovation Index can be used to gain good practice or benchmark either within or between industries by identifying the sectors that are scoring at a high rate, whether overall or in specific areas of the performance metrics.

READING LIST

- Brand, A. (1998), "Knowledge Management and Innovation at 3M", *Journal of Knowledge Management*, Vol. 2 Issue: 1, pp. 17–22. (This article will be available in your online student resources.)
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Summary

This chapter looked at the information requirements needed to manage innovation within an organisation. Linking with Chapter 1, it explored the need to and ways of measuring processes that may seem intangible.

Three main areas were examined – what an innovative organisation looks like, how innovation impacts performance and how organisations ensure the impact of innovation.

The innovation value chain was used to identify where a product or process moves from idea to diffusion, and the importance of managing this chain to ensure no potential is wasted was highlighted.

Chapter 4

Managing Risk in Innovation

Introduction

This chapter focusses on the risks associated with innovation. Not all innovative products and services become successful, or even make it past being simply an idea to become a viable, tangible product.

There are some key **ethical issues** that organisations must face when they are adopting innovative ideas and processes; how these relate to the concept of corporate social responsibility will be addressed.

Learning outcomes

On completing the chapter, you will be able to:

4 Evaluate the risks and uncertainties that innovation creates for business performance

Assessment criteria

4 Evaluate the risks and uncertainties that innovation creates for business performance

- 4.1 Appraise the risks and uncertainties associated with innovation that may affect business performance
- 4.2 Discuss the potential causes of failure in innovation activities
- 4.3 Assess the legal and ethical issues that can pose risks to innovation performance
- 4.4 Analyse the key ethical issues pertaining to innovation and the implications for corporate social responsibility and governance

Level 5 Innovation and Business Performance

4.1 Risks and uncertainties associated with innovation that may affect business performance

Risks and uncertainties

Definitions of innovation include “new methods”, “change” and “transformation”. Therefore, by its meaning, there is an uncertain element in innovation.

Risk is the combination of:

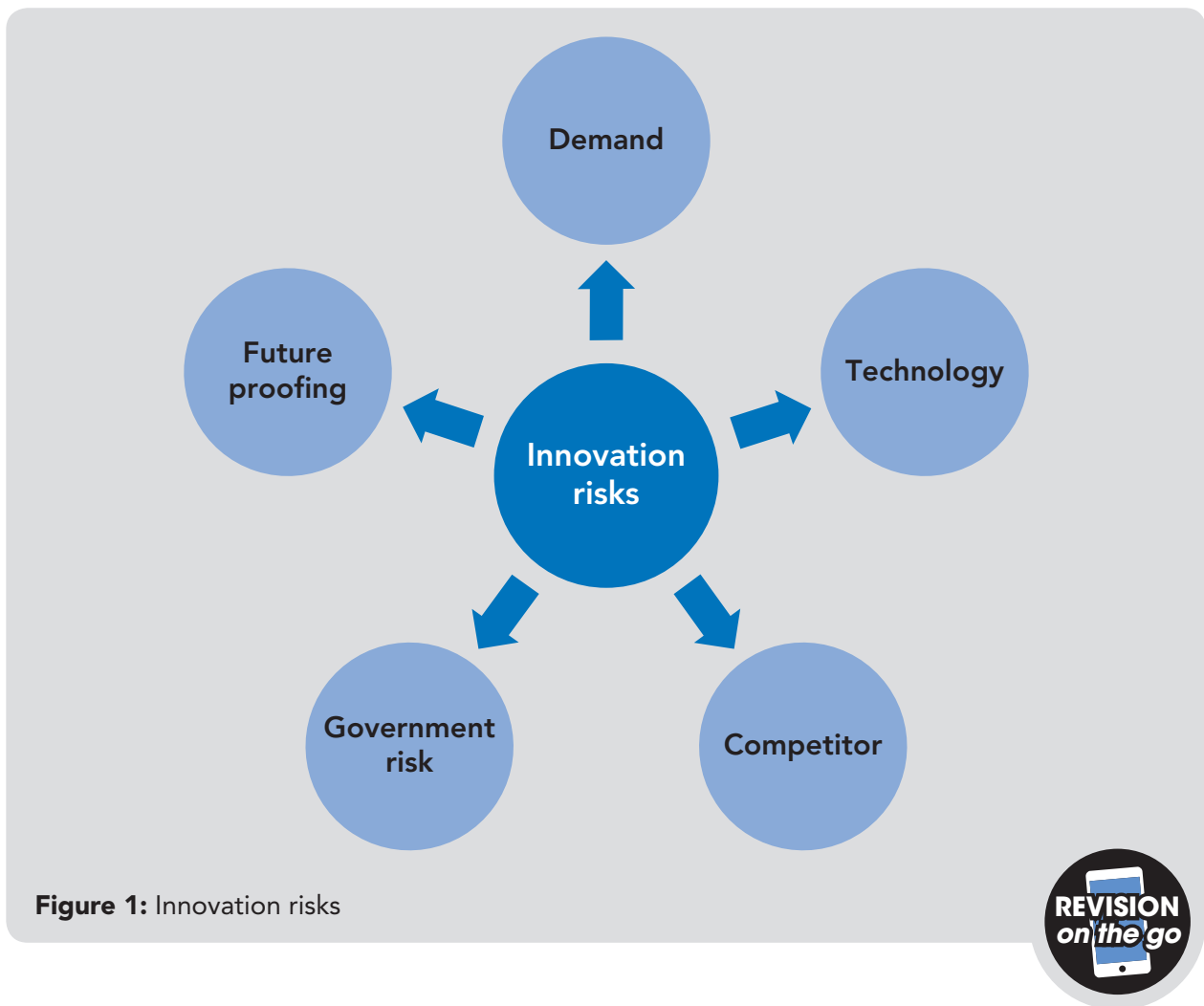
- an event or change occurring;
- the probability that this may occur;
- the impact this event or change will have.

There are many case studies of failed innovations that have caused significant problems and losses for organisations, and these outnumber the successes. However, like all risk, a clear and well-executed plan can help to minimise the impacts of failed innovation.

In Chapter 3, Section 3.1, the plan of having two streams of innovation (disruptive and incremental) being managed separately was discussed. The benefit of this is if there is radical innovation which fails, profit (at a lower margin) will still be realised from incremental gains.

The structure of the organisation was also raised in Chapter 2, Section 2.4, suggesting that using an ambidextrous organisation would support the management and control of innovation.

There are other methods to reduce risk and these are affected by the type of risk itself and where in the innovation chain the risk will occur.



Sources of innovation risks

With the high cost of innovation, the risks can seem overwhelming to an organisation. Often, the cost of not innovating is ignored, as with the rapid changes in technological development, it is argued that innovation must now be a way of life for an organisation.

This means the risks must be assessed and mitigated as they cannot be a barrier to innovation.

Demand: It is difficult to assess the demand for innovative products. For changes in processes, there may be clear benefits to an organisation, but for a new product, the success is impossible to judge.

Technology: It could be that technology moves on while the product is being innovated and so is redundant. Keeping on track with technological developments is key to limiting risk but this risk cannot be reduced to zero.

Competitor: In all areas of business, competitive pressure causes difficulties, but the race to become the innovative dominant product causes further pressure. It is not always about being first but the best to market (see Betamax vs VHS case study in Chapter 2, Section 2.3).

Government risk: Changes in legislation or new regulations can both encourage and discourage innovation. It may open up new markets but regulations may stifle current ideas or create a cost barrier that is too high to overcome.

Future proofing: With high rates of innovation, products must achieve a quick return on the investment made before they become outdated or overtaken by newly launched ideas. Looking at the rate of change of innovation in mobile technology, the early months are key to not only gaining early adopters but also recouping investment costs.

CASE STUDY

Blockbuster Video

Blockbuster was a global video (and later DVD) rental organisation, founded in 1985, that rented films to customers for one to two evenings. Late returns incurred a penalty charge. In the UK, it was the main rental chain with over 1700 stores nationally.

However, when competitors, that focused on posting DVDs to viewers' homes, started to take hold of the home film market, Blockbuster did not change its model – even when it had the opportunity to buy its main online rival, Netflix. It remained on course with its original operating model where customers would have to make two trips to their store – one to collect, the other to return the film.

Once Netflix began streaming films, it was too late for Blockbuster to compete with the instant download market and it never recovered its position. It filed for bankruptcy in 2010.



Attitudes towards risk

The impact of the team members' attitude to risk can have a significant influence on the tolerance of risk.

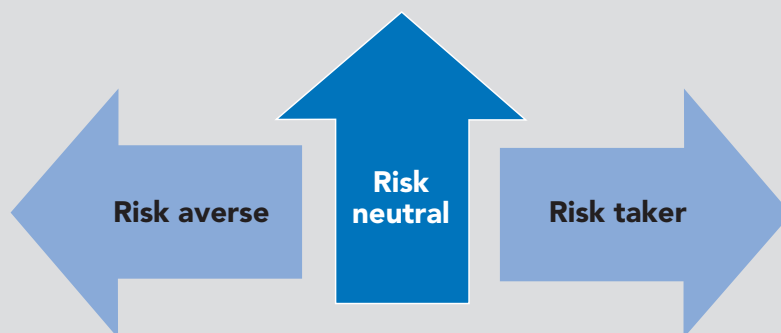


Figure 2: Attitudes towards risk

REVISION
on the go

- A risk averse decision-maker will avoid risks and stop a risky project early as any risk increases.
- A risk neutral decision-maker will make a balanced decision, weighing up the possibilities of gains or losses.
- A risk taker is more likely to support a project, the bigger the opportunity and the greater the reward, and is less likely to stop as the risk increases.

It is important that the risk profile for all those involved in the decision-making process is considered, not just the key decision-maker, as the influencers in the innovation project will convey proposals in the light of their risk profile.

External risks to the innovation process

Risk	Reason	Stage affected	Ways to overcome
Demand	Uncertain demand for the good or service	Diffusion	Focus on market testing and sales techniques
Technology	Will technology have moved on or is the product too advanced for current platforms?	Conversion	Improve environmental scanning
Competitor	Will competitors beat you to market or infringe your IP?	Idea generation and conversion	Improve environmental scanning, consider open innovation or straight-to-market IP strategy
Government risk	Regulations, withdrawal of funding or tax-breaks may affect innovation or cost effectiveness	Idea generation and conversion	Lobbying, communications and PESTLE
Future proofing	Rate of innovation is high in some sectors (such as mobile technology)	Diffusion	Focus on sales technique to accelerate adoption in the market

Table 1: External risks to the innovation process



Internal risks to innovation

Risk	Reason	Stage affected	Ways to overcome
Investment risk	Costs are too high and unlikely to recover during the product life cycle	All three stages	Consider incremental innovation and reliance on smaller gains
Open innovation	Releasing too much information to competitors	Conversion	Strategic alliances to continue or cease innovation

Risk	Reason	Stage affected	Ways to overcome
Concentration of resources affects core products	Not enough talent in-house to progress ideas	Conversion	Increase staff numbers
No capacity to implement the innovation	Staffing unable to cope with current and future demands	Conversion and diffusion	Increase staff numbers

Table 2: Internal risks to the innovation process



 OVER TO YOU

Activity 1: Your risk profile

**Are you risk averse, risk neutral or a risk taker?
 Search for online tests that assess your risk status.
 Complete one or two of them. What do they say about your risk profile? Do you agree and why?**

4.2 Potential causes of failure in innovation activities

Why great innovations fail

Chapter 2, 3 and Section 4.1 of this chapter described the problems associated with innovation. With such problems, it is understandable that organisations are risk averse when deciding to invest in innovation. However, this is not a sensible path. As stated in Chapter 2, Section 2.1, research by NESTA shows that innovating organisations grow significantly faster than those that are not, and, on average, innovating organisations experienced four times the sales growth of non-innovators in their sample.

Often, a failure to innovate leads to a quick demise of an organisation as they have not kept ahead of technology, for example Blockbuster (as discussed in Chapter 4, Section 4.1).

CASE STUDY

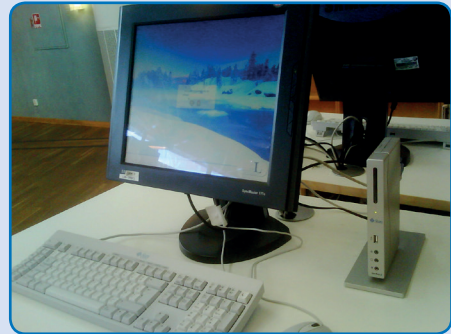
The failure of Sun Ray

Though it was considered to be a great product, the Sun Ray computer did not gain the expected competitive advantage in the marketplace. It encountered the “innovator’s dilemma” and failed to move to the early majority phase of the innovation life cycle.

This case study highlights the role and impact of both management and differing goals in the business which affected its growth and uptake in the market.

Read this article on the subject:

(2009) “Why Sun Ray failed to shine: ‘Innovation trauma’ hinders new product”, *Human Resource Management International Digest*, Vol. 17 Issue: 2, pp. 8–10. (This article will be available in your online student resources.)



Reasons for failure

The organisation did not define its goals

If an organisation does not know where it is going, it is unlikely to be successful. To develop an innovation culture, it must set out its aims clearly in its strategy and communicate them throughout the organisation.

The organisation’s actions were different to its goals

When senior management do not forgive failure in the innovation process, which is an inevitable occurrence in most cases, then innovating teams are not as successful.

No one wants to fail but it is part of the risk-taking process. The high cost of innovation with low returns has been discussed throughout this guide. If organisations are to innovate then acceptance of this risk and the results is required, otherwise teams will be afraid to try and will take limited risks.

The organisation did not encourage team participation and communication was poor

As open innovation shows, the greater the involvement in innovation, the greater the chances of positive results. Even if this innovation is closed within an organisation, if teams work in isolation and do not communicate, or an air of secrecy is encouraged, then ideas may be missed, or costly mistakes occur when the “wrong” products are developed due to limited communication.

Results were not monitored

KPIs and monitoring systems are now available for all areas of innovation. However, poor project management and monitoring can result in a rapid escalation of costs and make innovations unviable.

There were insufficient resources to manage the innovation process

Due to the high cost of innovation, resources, both human, physical and financial, must be monitored.

By using sound project management techniques, resources can be managed by listing requirements, meeting the resource needs and assessing whether utilisation is optimal. This should occur throughout the process. Failure to do so will risk the innovation process, as costs become uncontrollable.

The process was poorly managed

This links together many of the other reasons listed for failure. Without control of the innovation process, work may be duplicated, useful ideas may be overlooked and possible synergies and opportunities missed, which could be crucial for the success of an innovation and ultimately the viability of an organisation.



OVER TO YOU

Activity 2: Examples of why innovations fail

Research two innovation failures. Which of the reasons listed below were key to their failure?

- The organisation did not define its goals;
- The organisation's actions were different to its goals;
- The organisation did not encourage team participation;
- Results were not monitored;
- Internal communication was poor;
- There were insufficient resources to manage the innovation process;
- The process was poorly managed.

1

2

Creating an environment for successful innovation



Figure 3: Success factors



The issues that have been raised throughout this study guide lead to a combination of factors that can set the right environment for innovation within an organisation.

Innovation can occur without these factors but experience has shown that the more factors that are available, the higher the chances of innovation.

This does not guarantee that innovations produced in this environment will be successful but there are many examples to indicate that these conditions lay the foundations.

4.3 Legal and ethical issues that can pose risks to innovation performance

Intellectual property rights protection (IPR or IP)

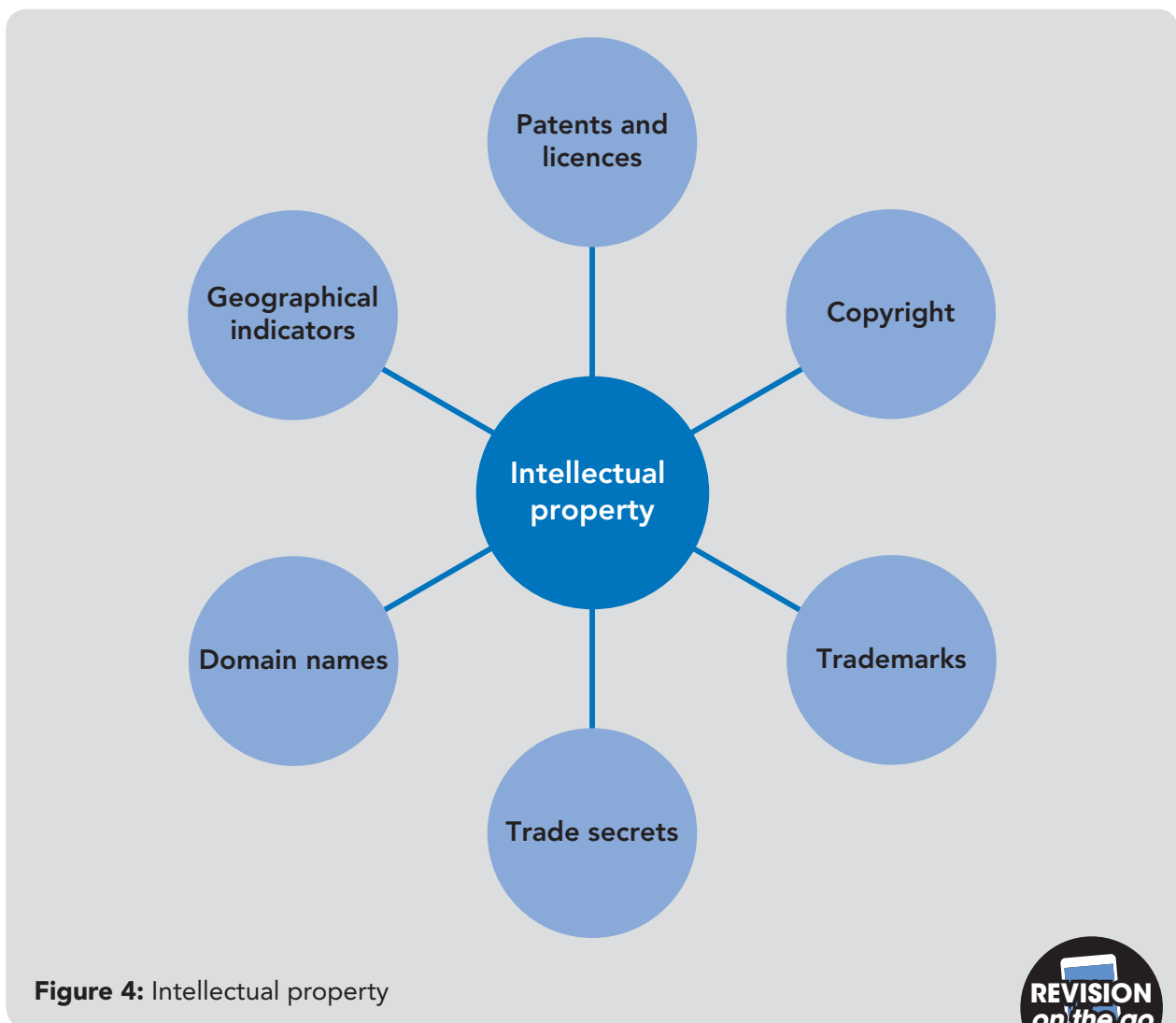
This is defined as the property of someone's mind or intellect. There are two main categories:

- Industrial property rights, including:
 - patents for inventions, trademarks, industrial designs and geographical indications

- Copyright literary and artistic works:
 - novels, poems, plays, films and music
 - drawings, paintings, photographs, sculptures and architectural design
 - rights related to copyright include those of performing artists in their performances, producers of phonograms in their recordings, and broadcasters in their radio and television programmes.
- Further benefits
 - IPR not only offers protection but can also be of monetary value through licensing the product and gaining upfront fees and royalties.
 - IPR has value on the balance sheet which increases the overall asset value of the organisation. This may improve the capital gearing ratio and may raise the borrowing capacity of the organisation.

This article by Naranjo-Valencia, Jiménez-Jiménez and Sanz-Valle (2011) looks at the choices organisations make in the innovation process: “Innovation or imitation? The role of organizational culture” (this article will be available in your online student resources).

Main types of intellectual property



The main types of intellectual property are:

- **Patents:** A patent is an internationally recognised licence that gives an inventor protection for a limited period (e.g. 20 years, or 25 years for medicinal products) to stop others from copying, making, using or selling the invention without the patent holder's explicit permission. Patents are usually only granted for a fixed period and once this expires, the invention can be produced by anyone.
- **Patent licences:** Organisations that own patents are able to sell licences to other organisations around the world, to produce and/or market the products or inventions covered by the patents. Licences can cover specific countries or regions and have specific lifetimes at the end of which they have to be renewed.
- **Copyright:** Copyright law usually relates to printed material, designs, drawings and graphics, electronic data, films and music. It does not protect the idea but rather the copying of material, by giving the owners of the copyright the legal right to sue anyone who breaches it. The copyright usually belongs to the author or creator of the material, although where this is an employee of an organisation, the copyright would normally belong to the organisation. Copyright protection allows the originator to benefit financially from their creation; hence, any use or reproduction requires permission and usually payment. When material is made available to the public, such as library books, musical performances, CDs and DVDs, payment is usually collected by a regional Public Lending Right organisation. These organisations calculate average use for each item and arrange royalty payments, which are funded by charges to the end users.
- **Trademarks:** A trademark is a sign, including logos, words, colour combinations and slogans, which will distinguish the products, goods or services of one provider from those of another. Classic examples are the Coca-Cola design, the Virgin logo, or the McDonald's "golden arches". Trademarks can also be registered internationally via the World Intellectual Property Organization (WIPO).
- **Trade secrets:** These are not actually registered like trademarks or patents, but they still need to be protected under confidentiality laws. They could include new designs or inventions that are under development but not yet ready for patenting. Employees who are working on them, or potential investors in new projects, may be asked to sign a non-disclosure agreement (NDA) which, if breached, could result in litigation and claims for damages. In addition, employees working with trade secrets will often have clauses in their contracts of employment, restricting future employment by rival companies for a period of time, and requiring non-disclosure of any trade secrets to any third party.
- **Domain names:** The Internet Corporation for Assigned Names and Numbers (ICANN) is responsible for the generic top-level domains such as .com, .net and .org.
- **Geographical indicators:** These are products that come from a specific geographical region, the name or brand of which is synonymous with that region. Examples include Champagne: by virtue of the process (the method "champenoise") and locality in a specific region of France.

There are two main international organisations that handle IPR registrations and protection: WIPO and the **World Trade Organization (WTO)**.

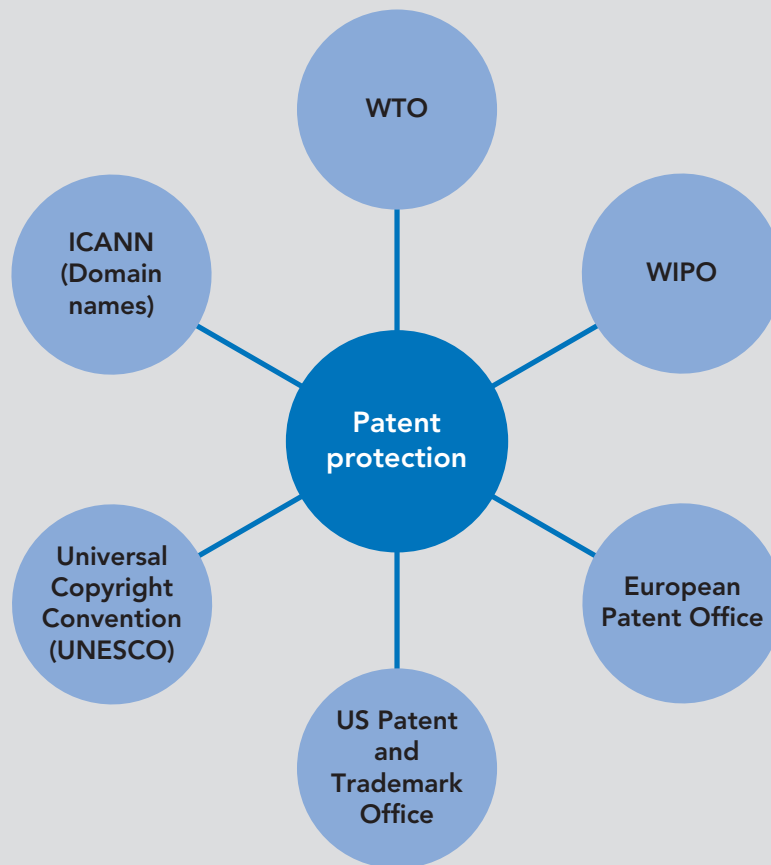
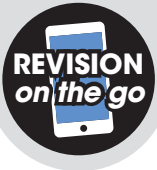


Figure 5: Patent protection bodies



Problems with intellectual property rights

- Expense – initial and ongoing cost:

IP is very expensive to protect. Typically, a single patent will cost between £5000 and £6000 for the initial Patent Cooperation Treaty (PCT) application, plus a further £20,000 to £25,000 for full publication of the patent. In addition, over its 15- or 20-year lifetime, additional maintenance fees have to be paid. This cost can be prohibitive for small organisations.

- Worldwide enforcement:

The biggest problem with owning IP is the issue of worldwide enforcement against unlicensed copying of the patent. When an organisation becomes aware of an infringement against its patent, it first has to identify exactly who is infringing it – the seller or producer?

The cost of legal services and translation can be very high. Compensation may be available but it is difficult to obtain.

- Legal patent copying:

Another issue is that of legal patent copying whereby patent technology is modified enough to bypass the patent restrictions. Though the product may have similar qualities or processes to the original, there is sufficient difference to ensure there is not breach of patent.

This is one of the reasons that some innovative organisations will adopt a first-to-market strategy to launch their new product and get it established as the market leader before their rivals have time to respond. Not only do they save substantial patent costs, but they might typically have a one- or two-year lead in the market with 100% market share.

The patent registration process

The key to successful patent protection is being able to demonstrate that the new product innovation is genuinely original and is not already in the public domain in any form – hence the importance of keeping it covered by non-disclosure agreements. The easiest way to start the patent process is to do a simple internet search using several keywords. This should indicate what other similar or substitute products already exist or are protected. A more detailed follow-up search can be carried out using the same keywords via national patent offices or, in the UK, via the British Library, for which a fee may be payable.

If the preliminary search is successful in revealing no significant direct competitors, then a patent attorney (a specialist patent lawyer) can be used to carry out a more detailed search. Only if the search process verifies that the invention is new and innovative, has not been previously registered, and does not appear to infringe previous patents will the process move to the next stage.

Once the application has been made, there is a temporary period (patent pending) during which the invention cannot legally be copied. This provides the applicant with protection until the patent is approved and published. At the end of this period of scrutiny and rejection, if the search process has revealed no potential infringements and if there are no objections raised, the patent application can move to full publication. This gives full protection for the countries that are members of the treaty under which the patent was filed.

Information about registering patents and other forms of IPR is available from the UK Intellectual Property Office (formerly the Patent Office)¹, the World Intellectual Property Organization², and also the World Trade Organization³.

CASE STUDY

Ethical issues in open source software

A case study concerning ethical issues in open source software from Grodzinsky, Miller and Wolf highlights points regarding innovation, particularly in the area of open source software. These can be applied to most other innovations. Read this article:

Grodzinsky, Miller and Wolf (2003), “Ethical issues in open source software”, *Journal of Information, Communication and Ethics in Society*, Vol. 1 Issue: 4, pp. 193–205. (This article will be available in your online student resources.)



4.4 Key ethical issues pertaining to innovation and the implications for corporate social responsibility and governance

The push to be first to innovate and gain market share is common competitive practice – the race to the top. However, business is changing. The measurement of corporate social responsibility

¹ For information from the UK Intellectual Property Office, follow this link: www.gov.uk/government/organisations/intellectual-property-office

² For information from the World Intellectual Property Organization, follow this link: www.wipo.int

³ For information from the World Trade Organization, follow this link: www.wto.org/english/tratop_e/trips_e/trips_e.htm

(CSR) and the importance of ethical supply chain relationships encourage organisations to follow a path of cooperation, giving back and social responsibility. For those that do not there can be consequences, both in the relationship with customers and with other stakeholders, which could ultimately impact upon the “bottom line”.

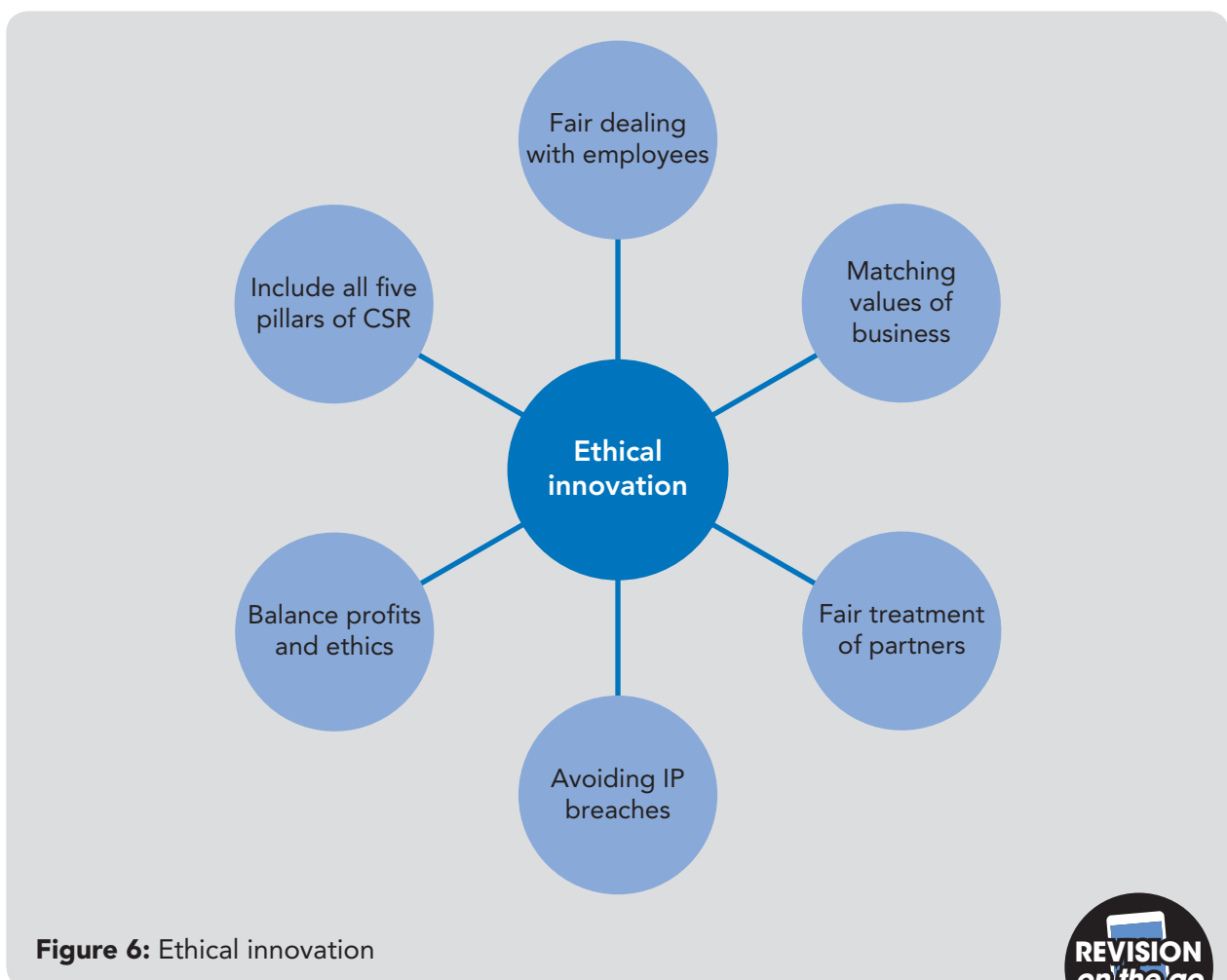
Areas of innovation are also encouraging partnerships with suppliers and customers in the development of new products. Open innovation relies on the contribution of others to develop models – often for free and without recognition.

Therefore, organisations must consider the ethics of innovation, including both the positives and negatives. The concept of intellectual property, considered in Chapter 4, Section 4.3, becomes an ethical issue when organisations are using published patent information to produce a new product that does not infringe the copyright.

Therefore, it is fair to ask, “If innovation is made at the expense of others, how does this impact an organisation’s corporate social responsibility?”

Read the article by Isabel Gallego-Álvarez, José Manuel Prado-Lorenzo and Isabel-María García-Sánchez (2011), “Corporate social responsibility and innovation: a resource-based theory” from *Management Decision*, Vol. 49 Issue: 10, pp. 1709–1727. (This article will be available in your online student resources.) It provides some insight into the relationship between corporate social responsibility and innovation within an organisation.

Ethical innovation



When it comes to innovation, there are ethical issues to be considered for all organisations. These issues involve both internal factors (such as the treatment of employees) and external factors (such as the impact on the environment).

Ethical issues within an organisation

The main ethical issue within organisations is that all employees should show respect to their colleagues. Three key elements of this are:

- **Acceptance:** This is where ideas are put forward in an atmosphere of acceptance. That is that no idea will be ridiculed. Many great innovations have occurred out of sessions where blue sky thinking delivers outrageous ideas but it sparks an idea that develops great products and innovations.
- **Recognition:** An organisation must be ready to accept ideas and congratulate those that put them forward, rather than the senior team taking the credit. Reward may not be financial but a willingness to recognise achievement is important ethically and builds better working relationships.
- **Dealing with failure:** Accepting that if time is given for consideration of innovation, then failures are a common outcome. This should not encourage staff to do nothing and concepts such as the WL Gore “dabble time” need to be strictly managed, but, considering many innovations do fail, instilling a culture of innovation will mean the acceptance of some failures. For an organisation, learning from failure can be an opportunity in itself so that mistakes become fewer and are never repeated.

Ethical issues external to an organisation – matching innovation values with corporate social responsibility

If an organisation has values and a mission statement that is linked to behaving ethically and/or including CSR and sustainability aims, this needs to be included in their innovation strategy too.

Innovations can occur because of a direct aim to reduce, for example, carbon emissions.

How is this achieved?

By including innovation targets at every measurement stage, organisations can ensure CSR sustainability and ethical factors are considered at each stage of development.

This can be achieved throughout the innovation chain by specific KPIs focused on these **five pillars of CSR**:

- Environment – Ensuring the innovation at least does not decrease environmental standards, such as pollution, noise or using unsustainable resources.
- Community – Aiming for the innovation to have clear benefits either directly or indirectly (specific local employment targets).
- Diversity – Maintaining or improving the diverse make-up of the workforce.
- Wellbeing – Innovating to improve health and wellbeing or indirectly using the innovation to benefit society.
- Operating practices – Making the innovation process as efficient as possible.

CASE STUDY

Tesla: "Our patents belong to you."

Overnight in 2014, Tesla, the technological electronic vehicle organisation, removed all its patents from the wall of its HQ in the USA overnight. It withdrew its patents in an attempt to accelerate the growth of electric cars.

It believed that the market for electric cars would benefit from a common technology platform and Tesla couldn't develop this market on its own in an industry dominated by gas/petrol.

Source: www.tesla.com/en_GB/blog



Fair treatment of partners

With greater involvement with partners – suppliers, customers or other stakeholders – working in a culture of integrity, trust and openness is key, with fair remuneration for all contributions to the innovation. For fair treatment of partners, it is important that leaders promote a clear and consistent message that there will be no breach of other organisations' IP, use of legal patent copying or using fake or substandard products in the process.

CASE STUDY

The Ghanaian economy

This is a useful article on the link between sales, innovation and CSR policies in the Ghanaian economy:

Mohammed Abdulai Mahmoud and Robert E. Hinson (2012), "Market orientation, innovation and corporate social responsibility practices in Ghana's telecommunication sector", *Social Responsibility Journal*, Vol. 8 Issue: 3, pp. 327–346. (This article will be available in your online student resources.)



READING LIST

- Gallego-Álvarez, I., Manuel Prado-Lorenzo, J., García-Sánchez, I. (2011), "Corporate social responsibility and innovation: a resource-based theory", *Management Decision*, Vol. 49 Issue: 10, pp. 1709–1727. (This article will be available in your online student resources.)
- Grodzinsky, S., Miller, K., Wolf, M. J. (2003), "Ethical issues in open source software", *Journal of Information, Communication and Ethics in Society*, Vol. 1 Issue: 4, pp. 193–205. (This article will be available in your online student resources.)
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- Naranjo-Valencia, J. C., Jiménez-Jiménez, D., Sanz-Valle, R. (2011), "Innovation or imitation? The role of organizational culture", *Management Decision*, Vol. 49 Issue: 1, pp. 55–72. (This article will be available in your online student resources.)
- (2009), "Why Sun Ray failed to shine: 'Innovation trauma' hinders new product", *Human Resource Management International Digest*, Vol. 17 Issue: 2, pp. 8–10. (This article will be available in your online student resources.)

Summary

This chapter concluded the study guide with an evaluation of the risks and uncertainties that innovation creates for a business. It continued the theme of why innovation may fail and how businesses can work to reduce risks but never fully eliminate them.

The chapter ended by discussing the importance of considering the ethical and legal issues of innovation. This included intellectual property protection as well as how organisations act ethically in their development of innovations.

Conclusion

Through the use of case studies and theories, this guide has presented the need to monitor and measure all performance within the workplace and provided examples of how KPIs can be used to effectively measure performance.

Using current models of innovation, from Tesla to the 2017 Global Innovation Index, contemporary issues in the area of innovation have been explored, where organisations need to balance the push for innovation with methods of control and maximising chances of success, in an area where success cannot be guaranteed.

Each issue for performance measurement and innovation has been supported with examples to investigate, together with resources and case studies to gain broader information and practical application.

Guidance

Guidance for Chapter 1, Activity 3: Worked example of performance measurement for Phonebitz Ltd.

Measure	Definition	2017 calculation	2016 calculation
Return on capital employed (ROCE)	$\frac{(\text{Net profit} \times 100)}{\text{Capital employed}}$	$\frac{(40 \times 100)}{65} = \mathbf{61.5\%}$	$\frac{(30 \times 100)}{25} = \mathbf{120\%}$
Gross profit margin	$\frac{(\text{Gross} \times 100)}{\text{Revenue}}$	$\frac{(100 \times 100)}{125} = \mathbf{80\%}$	$\frac{(80 \times 100)}{100} = \mathbf{80\%}$
EBITDA	Earnings before interest, tax, depreciation and amortisation	$40 + 15 + 5 + 10 = \mathbf{£70k}$	$30 + 10 + 5 + 10 = \mathbf{£55k}$
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	$\frac{30}{10} = \mathbf{3:1}$	$\frac{20}{10} = \mathbf{2:1}$

Glossary

Benchmarking The use of standard measurements to compare an organisation's processes, performance and products with those of its peers.

Business drivers Resources, processes or conditions that are vital for the continued success and growth of a business. Business drivers may be under or outside of the control of the business.

Business model The organisation's entire system, which is designed to enable it to compete effectively in the marketplace. A business model is made up of all of the factors that describe a business, including the market it serves, how it creates value, and the factors that will sustain it in the long term.

Core competencies Those capabilities which, collectively, are critical to a business in achieving competitive advantage. According to Prahalad and Hamel (1990)¹, core competencies are the "harmonized combination of multiple resources and skills that distinguish an organisation in the marketplace."

Corporate social responsibility (CSR)

Policies and practices designed to meet the needs of a wide range of stakeholders and society as a whole.

Diffusion The process by which the uptake and adoption of an innovation spreads among the market participants over time.

Ethical issues Problems or situations that require a person or an organisation to choose between alternatives on the basis of what they perceive to be right (i.e. ethical) or wrong (i.e. unethical).

Five pillars of CSR These are the five areas that companies often commit to address in their corporate social policy. They are: environment, community involvement, diversity and inclusion, wellbeing, and operating practices.

Globalisation The movement towards worldwide interaction and integration of economic, financial, trade and communication activities. It implies a worldwide perspective, rather than a local or national one.

Incremental innovation A series of small changes made to existing processes, products or services to improve their performance or quality.

Incubator businesses Businesses which support and develop start-up businesses.

Index A measure of something, often using statistics.

Innovation Putting into practice ideas that are new to the organisation.

Lean manufacturing A way of improving manufacturing processes by eliminating waste at all points.

NESTA National Endowment for Science, Technology and the Arts, an independent charity that works to transform the UK's capacity for innovation.

Open innovation An approach to innovation in which the organisation shares knowledge and expertise with external stakeholders such as suppliers, key customers and associated organisations.

Organisational culture The shared attitudes, values and beliefs of employees within an organisation.

Process A systematic arrangement of actions designed to achieve specific outcomes.

Project A short- or long-term task to develop a product, service or result. It is usually managed according to a set plan and timescale.

Risk The possibility of loss, injury or other adverse, unwelcome consequences. Risks can be measured and quantified in terms of a) the probability of the risk occurring and b) how severe the consequences of the failure are likely to be.

¹ Prahalad, C. K. and Hamel, G. (1990), "The core competence of the corporation", *Harvard Business Review*, Vol. 68, Issue 3, pp. 79-91

Risk management The methodical processes that organisations use to address the risks that are attached to their activities. Under risk management, risks have to be identified, assessed and prioritised. Steps are then taken to reduce the risks, failing which, the risk has to be accepted and managed.

Stakeholders The people and organisations that are affected by the business's actions and decisions taken.

Sustainability In business, this refers to growth that does not cause significant deterioration in the environment or in natural resources.

The World Intellectual Property Organization (WIPO) An international agency that is part of the United Nations which oversees services, policy, information and cooperation between the member nations, in regards to intellectual property (IP).

World Trade Organization (WTO) An international agency that deals with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible.